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International Colloquium of Art and Design Education Research (i-CADER 2014)

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Preface

The International Colloquium of Art and Design Education Research (i-CADER) is the first event of its kind in Malaysia that brings together academic artistes and designers from all over the world. i-CADER provides an international forum where practitioners, researchers, academic artistes and designers are able to interact and exchange experiences, ideas and research results that involve all aspects of quality of experience for current and future Art, Design and Technology and other areas of the Social Sciences. All theoretical, empirical and practical papers from scholars, professionals and post-graduate students that fall within the colloquium's scope were successfully presented in International Colloquium of Art and Design Education Research (i-CADER 2014). The scope of the i-CADER 2014 ranged from Design Technology and Industrial Application, Visual Communication and New Media, Arts and Crafts to the Cultural Studies and Social Implication of Art. This represents all branches in the discipline of Art, Design and Technology that when put together create new frontiers in research and education.

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Contents

Chapter 1
Structured Planning as a Front-End Process for Concept Design and Development

Natrina M.P. Toyong, Linda Abd. Hamid, and Mohd Shahril Rusman

Abstract This preliminary research is a study which assesses feasibility of a structured planning process developed and taught by Professor Charles Owen of Institute of Design-IIT to be used as a front-end process in the concept development stage using case study which focuses on the issue of culture conservation in a modernising society. The study will reveal deficiencies in the design of the proposed study when applied locally. This process focuses on finding, structuring, using and communicating information necessary for design and planning of large and complex system, conducted to develop an application for the culture conservation through analysis on the specific case study using five major steps: (1) Structured Project Definition, (2) Action Analysis, (3) Structuring, (4) Synthesis and (5) Communication. The outcome of the research can evaluate the underlying problem as well as provide an overview of a generic yet customisable solution that may go beyond the geographical and regional boundary to form a larger sustainable system.

Keywords Structured planning • Concept design • Large systems design • Design thinking • Design research

1.1 Introduction

The structured planning approach developed and taught by Professor Charles Owen of Institute of Design-IIT, Chicago, is a systematic planning process viewed as a front-end method to design-based solutions that can systematically undertake large complex problems. It was conducted in the duration of 1 year, which allowed the project to collect extensive data, and later broken down into sub-solutions presented in complete solution scenario format. In complex problems, concept solution

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becomes a challenge when it reaches the implementation stage. This is taken into account through highly structured documentation procedure. Key action is to ensure that all records can be supported by trails of evidence and proof of data origin. This applies to the raw data as well as all analysis and synthesised findings. The structured documentation process will be the key discussion of this paper. The research conducts preliminary studies on cultural decline to develop an application for culture conservation of the Kadazan-Dusun tribe of Sabah. This ethnic group makes up the largest indigenous population which is 25 % of the current 2,449,389 population. Younger generations of the Kadazan-Dusun are embracing modern lives leaving behind conventional yet important economic activities such as rice cultivation, evident in the barren rice/paddy fields. As a result, almost no prime land within the city area is left undeveloped. As land prices increase, older generations are forced to sell their land because the young leaves to seek work elsewhere. The preservation of culture and modernised lifestyle is highly imbalanced, leaning heavily towards the latter. Cultures that are kept alive are on surface level and mostly meant for show and not preserved with goals for its longevity. At this rate of change, more than half of the cultural roots today will be lost or deteriorate before it is passed on to the next generation.

1.2 Large Systems Design

Designing has become a complex field which involves a thorough data gathering process with even more methodical data analysis and synthesis practices. Various methods have been brought forward to tackle issues of large-scale design problems.

Economic Considerations

Designing has become a complex field which involves a thorough data gathering process with even more methodical data analysis and synthesis practices. Bringing together considerations for (1) large complex problems, (2) cohabitations of multi-field thinking and (3) relevant, measurable and implementable solution product or services, usage of computer-aided data management system is imperative.

The handling of data at times requires manipulation of more than a single database as there are many kinds of information which cannot fit into such data representation [18]. The buffet of tools must be able to provide easy, structured access to all design data as well as make all data visible from a unified point of view (regardless if they are stored in databases or plain files). It must be able to present data, appropriate to users and environment. Economic cultural change may be influenced

by many factors. Some are individual by nature and suggested to be caused by at least one part of societal change. However, there are enough cultural studies that suggest societal change by nature is complex and by itself requires a system's solution. In a paper by [5], it is suggested that a single unit of a large industrial development known as 'clusters' requires a cultural embeddedness (CE). CE of an economic cluster bears great weight on shaping the thinking and behaviour related to economic activities where [5, 12] suggest that factors such as local traditional values, customs, common practices and norms need to be studied to enable innovation.

Since the purpose of designing is to explore potentials of new product and services, its business context is significant to the process as it determines the viability of the solutions acquired through 'the identified problem space [9]. From a relevant perspective, business model is depicted as the content, structure and governance of transactions' designed to create value through exploitation of business opportunities. In this case, transactions become the link for activities, while transactions and activities can be viewed as two sides of the same coin [7]. This business understanding of correlation between understanding the human activity and its environment as a business case is what makes this structured planning approach to designing significant. Understanding the context of a problem therefore helps create a systemic and holistic view of the problem as well as solution.

Cultural Considerations

In a 3-year study by [11], the findings provided insight into implications of misunderstanding and not addressing cultural differences through the four key elements: geographical distance (physical separation), temporal distance (limitation of direct contact), linguistic distance and cultural distance. In all development, especially amongst society which was built on tradition, it is important that value is measured accordingly. McMurtry [3] in a paper dissecting the forces behind global system collapse makes a case on how current economic rationale may be misinterpreted as a positive balanced advancement of society when in fact it is merely a marketing doctrine which fails to realise the disorder it creates. When it comes to dealing with large systems problem, the solution is not just isolated to cultural human actions. It involves putting processes, equipments, technologies and economic function as enablers. In an analogous study on the issue of overfishing [6], ecosystem consideration in terms of biodiversity maintenance, stressor protection and socioeconomic benefits is as important as managing the problem through modification in regulations. Systemic problem must be dealt with a balance of changes in activity as well as amenities. Pinho et al. [1] supports this concept of multifaceted solution to a large problem through a research on community-based fisheries which claims to be consistent with predeceasing studies suggesting success which depends on practices that are embedded locally, socioculturally and historically.

Stakeholder Considerations

Looking from the perspective of stakeholders, many cultural decline cases can be attributed to loss of tradition during the transfer from one generation to another. The solution space needs to take into account that minimal data is lost during this transfer and taken from both the giver (older generation of the society) and the recipient (younger generation) [8, 13]. An interesting finding by [4] suggests that some form of leisure time activities can ensure mental health more than 20 years later. The paper thus suggests that where active lifestyle amongst middle-age adults should be encouraged, lifestyle intervention can increase strong mental health in late life. With this in mind, the solution space can consider the inclusion of middle-age member of the society as the bridge between the young and the old by offering better 'quality of life' value to them.

Inclusion of all members of a society is the best solution in building a sustainable solution space. In a study by [2], results show silo mentality can impact negatively on team identity. Here, [2] found that themes related to the physical environment and structure, intragroup relations, experiences of management and intergroup relations were becoming evident. Relating this to other findings [14], the same overarching importance of a balanced growth of multiple elements is further supported.

1.3 Structured Planning Process

For this research, the application of the structured planning process begins with a project charter which outlines the project statement, background, goals, resources, methodology and issues surrounding the research area. Large emphasis is placed on identifying high-level issues [16] that should be addressed early on before detailed bottom-up approach to looking at the problem can be done. The case for the cultural decline is seen from a few perspectives as suggested by earlier literature review. This is more so because not all issues are directly related and should be eliminated before unnecessary effort is placed into dealing too deep into them. This project resulted in 16 major issues in which defining 16 statement documents are produced to discuss each one of them.

Structured Project Definition

As a set of document, the Defining Statement was used to refine the description of the problem at hand through the examination of relevant issues. The contents of the document are results from further literature review or interviews from related sources. In this study, main research is focused on the economic considerations as sustainability. After all, economic viability was amongst the highest cited reason for why culture is being traded away by the younger generations.

In one Defining Statement document sample (see Fig. 1.1), questions are raised for the team to assume a position.

The question on how decisions on which values to preserve be made is an important one as it relates back to the decision by the younger generations that reflect on economic sustainability. At the same time, the team also keeps track of alternative positions which may occur in different scenarios, agreeing to look into cultures that have direct impact towards economy, politics and social values of the society [15]. The position called a 'constraint' will be used to make decision criterion later when deciding on 'Cultural Elements' or 'Activities' to prioritised. The Background and Arguments section of the template will document insights that were gathered from specific sources.

Action Analysis

This stage requires extensive ground research to learn and collect detailed data on human factors surrounding the cultural activities of the local. Site visits and data collection will involve observations and focus group research as well as follow-up interviews. To test the process, the cultural decline is viewed holistically as complex

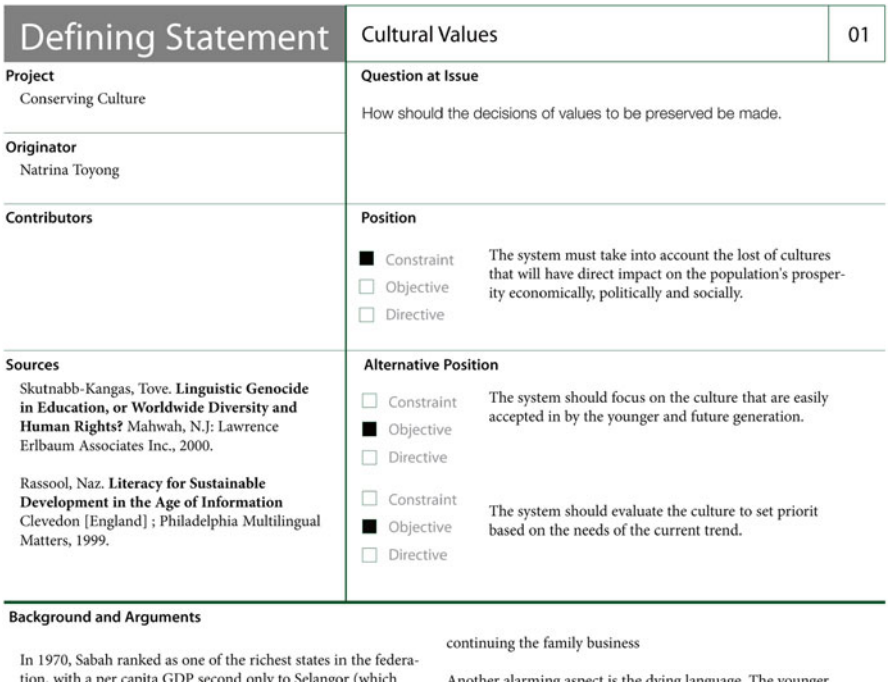

Fig. 1.1 Defining statement document

entity working with its users in different ways appropriate to its 'Modes' of operation. For the process to be effectively tested, 'Modes' and 'Activities' that occur within them must be identified, while 'Functions' that the users and system are intended to perform within each 'Activity' are isolated. The result of the 'Activity Analyses' conducted is a Function Structure. Action Analysis is partly required for the enumeration of functions and the development of information about these Functions to uncover insight that occur during the tasks. Specific thing such as why thing go wrong or right helps developed in documents that become part of the project knowledge base.

The function structure is a research team's overview of the topic landscape. In this study, literature and interview resulted in the drawing of a function structure with four sub-activities surrounding the current cultural conservation efforts: (1) Preservation, (2) Restoration, (3) Communication and (4) Maintenance. This structure does not necessarily reflect any existing hierarchical or organisational structure of any one department in the state of Sabah, rather it is a combination of many different governmental, non-governmental or individual efforts. As the case with how Defining Statement template helps document details found in the project charter, Activity Analysis forms are used as documentation of details which outlines all the conservation practices in action forms. The document records information at the Activity level which includes items such as associated Design Factors that documents insights and ideas associated with Functions involved (Fig. 1.2).

In short, the product of Action Analysis is three sets of critical information: a set of Functions (the Function Structure), a set of insights (Design Factors) and a set of preliminary ideas (Solution Elements). The order of the documentation is as

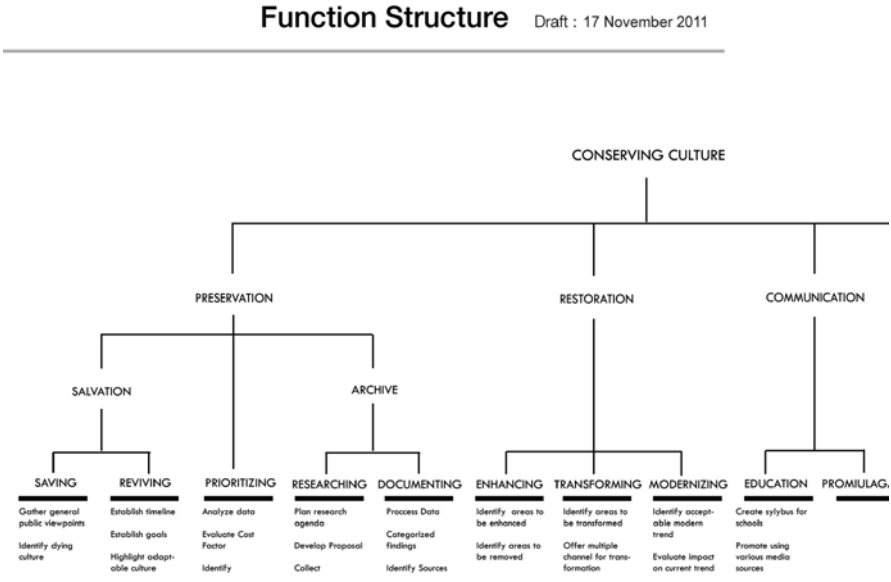

Fig. 1.2 Result of an activity analysis in function structure

follows: Solution Element form will support the Design Factors form, while Design Factors form will inform the Activity Analysis. In order to fully capture the ideas suggested on Design Factors, Solution Element is written in the Solution Element Description portion of Action Analysis. These are one-page documents designed to capture enough detail about ideas to give them substance when they are needed later.

In the sample (Fig. 1.3), the analysis on 'Prioritising' as an activity, the research team found that during evaluation on the cost of a culture as well as consideration of the stage of a culture's declining state, no guide has been established either by governing bodies or culture practitioners. Bringing the 'no guide for evaluation' as a factor, a Design Factor form is detailed out (Fig. 1.4). Research revealed that materials that are being used (if any) for evaluation purposes have questionable resources. This is further supported by description of current international practice which cites that although source identification is vital, it will incur additional costs; therefore, related funding bodies will probably need to be considered. At this point, the research team is uncovering more problems and is finding analogous studies to strengthen factors that will lead to design. General design strategies are then suggested with final Solution Elements written in short descriptive names which is able to suggest what the solution is and what the solution is intended to do [10]. In the

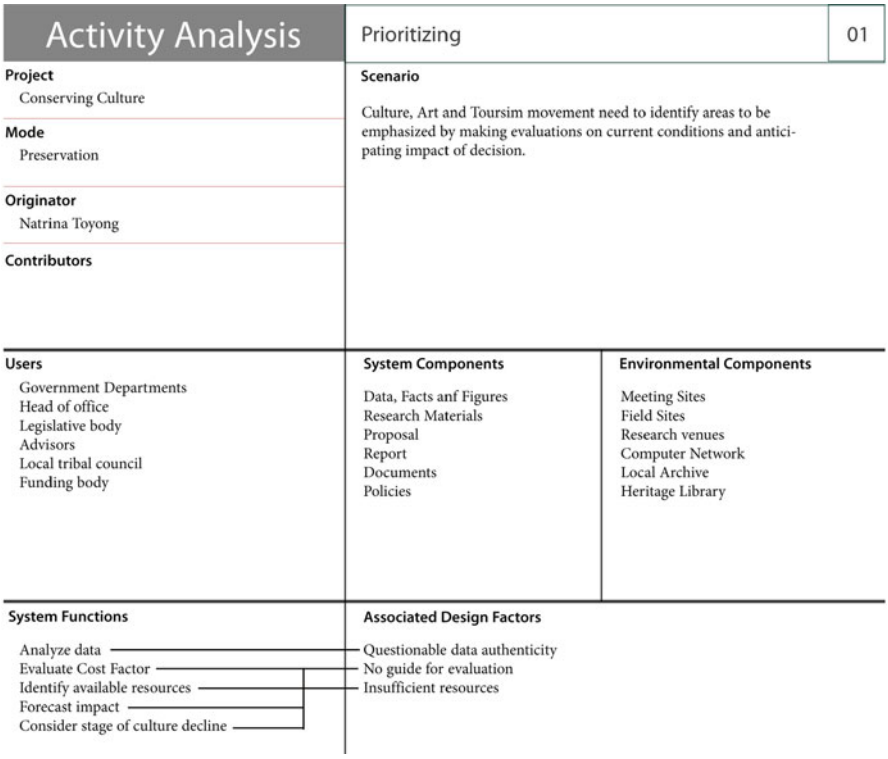

Fig. 1.3 Activity analysis document

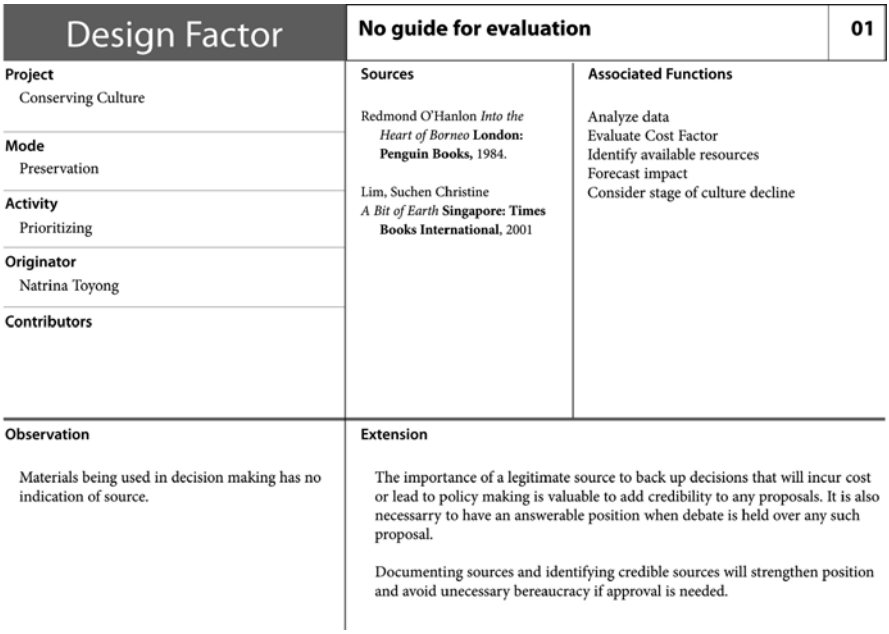

Fig. 1.4 Design factor document

sample of the *Solution Element* form (Fig. 1.5), the solution named 'Doc Guard' is fleshed out to aid later in the design process.

At this point the research team will make suggestions on what the 'Doc Guard' should do because it will also become a solution for other function elements besides the example found in Fig. 1.4.

Structuring

Once the process has gone from laying out the problems to drafting detailed suggestion for solution concepts, these data can be brought to the next stage where computer programs will reconstruct the problem space to suggest new ways of looking at the research space. At this stage, the reorganising information for use in concept development will be done using computer programs developed by Prof. Owen called RELATN and VTCON. The controlling factor for whether two Functions are associated from the planning standpoint is determined based on significant number of their potential solutions that are similar to one another.

The relation between Solution Elements to each Function is established in an Interaction Analysis procedure. The RELATN program uses this information in a Graph Construction process to establish links between Functions. The RELATN input file will start off with the complete list of Solution Elements. As a pilot test, there are 30 solution elements to allow for a faster synthesis process, followed by 40

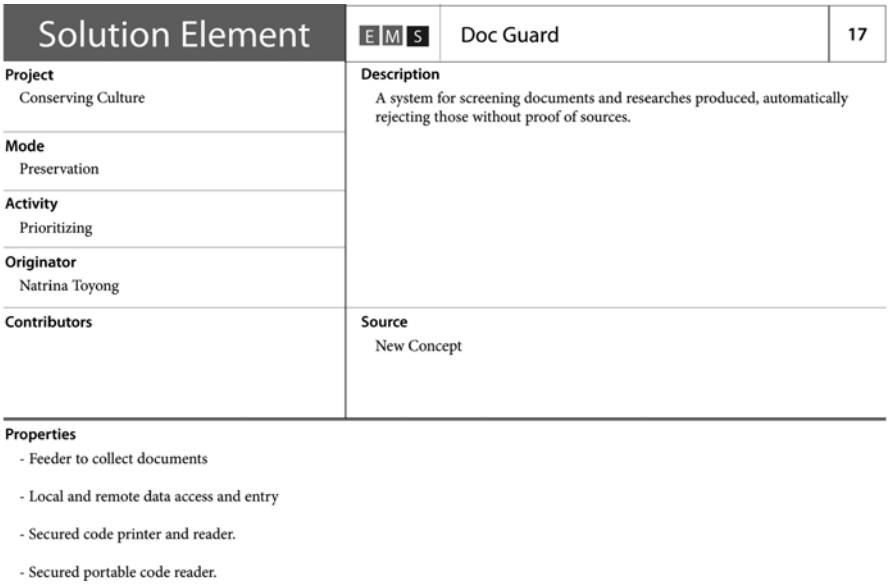

Fig. 1.5 Solution element document

function titles gathered from all the Activity Analysis documents, sample in Fig. 1.3, and its relation to each solution elements rated by scale of 1 to 5. A score '5' suggests that solution elements strongly support fulfilment of functions (Fig. 1.6).

Once scoring is done, the input file will run through the program to produce RELATN output file phase 1 which brings the research to the first hints of synthesis process. The output of the RELATN program is in a form of a histogram with data on frequency and class. The research team goes through an important meeting and decide on the threshold based on the greater value of the data labelled 'Number' found on the right-hand side of the document. Using the new threshold, the next phase of RELATN phase 2 is run. This stage onward became simpler as the output file; Fig. 1.7 clearly shows the elements (functions) and the solutions related to it.

The output suggests that element 1 which represents activities of 'Gathering Information' is highly related to solutions 13 (Silver Reviews), 19 (People Locator) and 21 (Source Okayed). The three solutions relate to activities of locating sources from word of mouth, getting information from the older generations as well as ensuring validity and certification of the sources involved. The next program, VTCON, is done to complete the information structuring process. The graph establishes paths through the Functions by linking them when they are related, in an arrangement that requires follow-up comprehension suggesting clusters of highly interlinked Functions and organises them into a semi-lattice hierarchy. This new hierarchy is called an information structure (Fig. 1.8).

This semi-lattice will be refined, taking into consideration the cluster group. Disentanglement of the hierarchy will result in a new hierarchical structure. The components at this stage are still represented by numbers. The team reworks the

```
022 Project Scheduler     001 4                1.0     5.0
023 Storage Genie         001 4                1.0     5.0
024 Virutal Museum        001 4                1.0     5.0
025 Goal Tracker          001 4                1.0     5.0
026 Easy Interview        001 4                1.0     5.0
027 Note Keeper           001 4                1.0     5.0
028 Trad Back Bone        001 4                1.0     5.0
029 Scene Matcher         001 4                1.0     5.0
030 Lost and Found        001 4                1.0     5.0

1
(I3,1X,5A4,5(F2.0,4F1.0),/,(12X,10(F2.0,4F1.0)))
001 Gather opionion       34345 54333 33523 54243 34435
001 Line 2    55333
002 Id dying culture      23243 33345 43455 34333 43434
002 Line 2    35335
003 Id dying art          23243 33345 43455 34333 43434
003 Line 2    35335
004 Id lost heritage      23243 33345 43455 34333 43434
```

Fig. 1.6 RELATN input file

```
Frequency                                  Number  Percent  Cumulative  Cumulative
Class                                                       Percent     Remainder

0.00 ************************************     32     4.11      4.10       95.90
0.01                                          0     0.00      4.10       95.90
0.02                                          0     0.00      4.10       95.90
0.03                                          0     0.00      4.10       95.90
0.04 **                                       2     0.26      4.36       95.64
0.05 ****                                     4     0.52      4.87       95.13
0.06 **                                       2     0.26      5.13       94.87
0.07 ******************                      16     2.06      7.18       92.82
0.08 *************                           12     1.54      8.72       91.28
0.09 ************                          11     1.42     10.13       89.87
0.10 *********                                8     1.03     11.15       88.85
0.11 ************                          11     1.42     12.56       87.44
0.12 ******************                      15     1.93     14.49       85.51
0.13 **********                              9     1.16     15.64       84.36
```

Fig. 1.7 RELATN phase 1 output file

structure to avoid as much redundancy as possible. In this research, however, four areas are unavoidable and are maintained overlapped which are components 208, 104, 105 and 115. At the later stage, when the naming began, the research team specifically discusses these areas. Gathering all the previous documents, the numbered components in the refined hierarchical structure (Fig. 1.9) are synthesised into a complete information structure (Fig. 1.10).

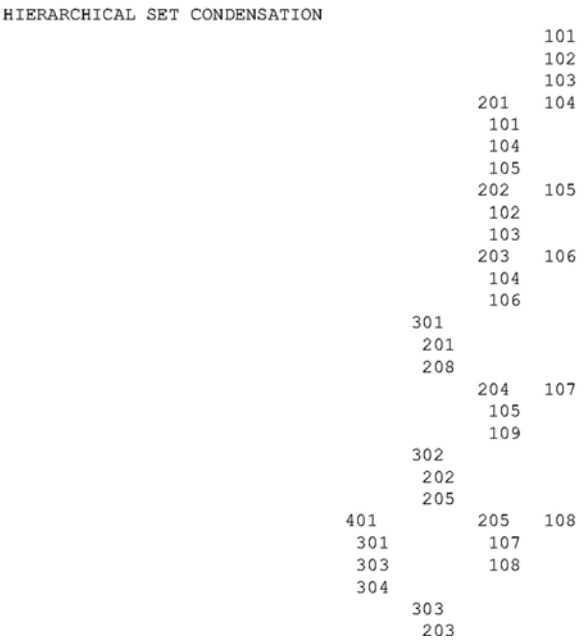

Fig. 1.8 VTCON semi-lattice hierarchy

Synthesis

Using the new completed information structure, the research team goes through bottom-up process, using a Means/Ends Synthesis template (Fig. 1.11). The process is then reversed as a top down where the team starts to ask the question using Ends/Means Synthesis template (Fig. 1.12). The next stage is where the research teams start synthesising the details of the system elements based on the ends/means analysis. Using a system element feature list template, the details of features relating to the 'Conserving Culture' function were defined (Fig. 1.13). Based on the features synthesised, the team then uses the features to judge system elements against the function using system elements template (Fig. 1.14).

In this form, the research team will decide on how strong the Features support certain Functions. This is represented by large or small boxes. The importance of this step is vital because good design solution later will depend on how functions are fulfilled when systems are able to do what is necessary [17, 19]. When systems direction has been identified based on which functions would be related, a system element relationship form is filled. The filled form (Fig. 1.14) is a sample from a larger template which shows the relationship of pairing in rows 1–3 with columns 5–7. Based on the element from the feature list form (Fig. 1.13), the larger format is composed of 10 rows and 10 columns.

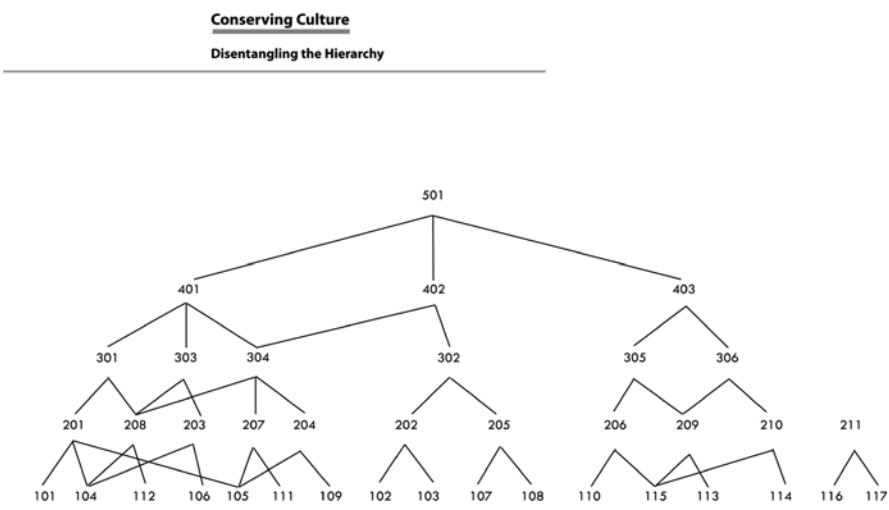

Fig. 1.9 Refined hierarchical structure

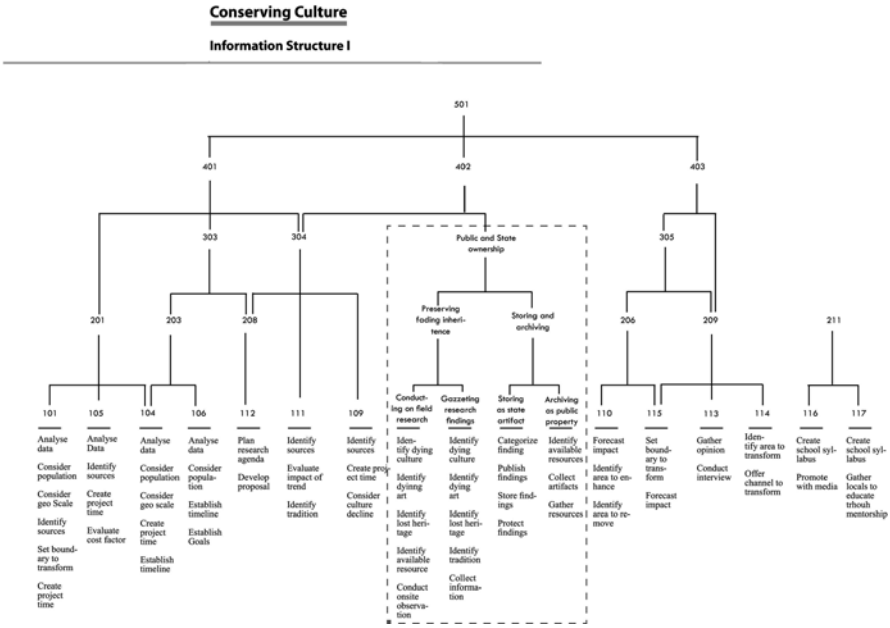

Fig. 1.10 Completed information structure

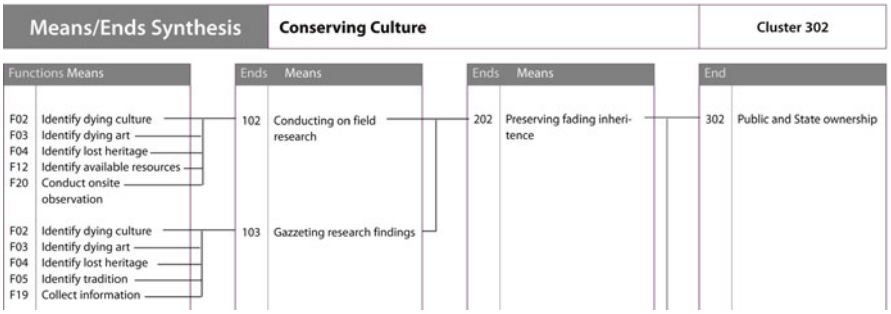

Fig. 1.11 Means/ends synthesis template

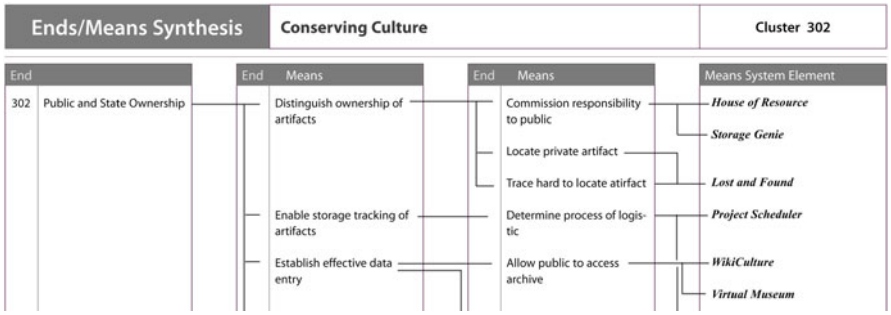

Fig. 1.12 Ends/Means Synthesis template

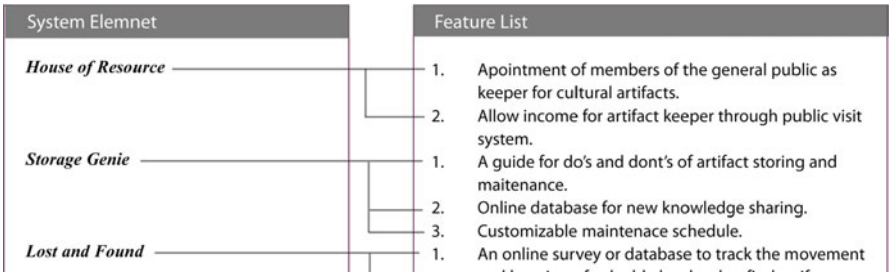

Fig. 1.13 System element feature list

Communication

Finally, once all the analysis and synthesis documentation is complete, the research team sits to draft out one of the most important parts of the process. The team will present all findings in a user-friendly format, which is through the common practice

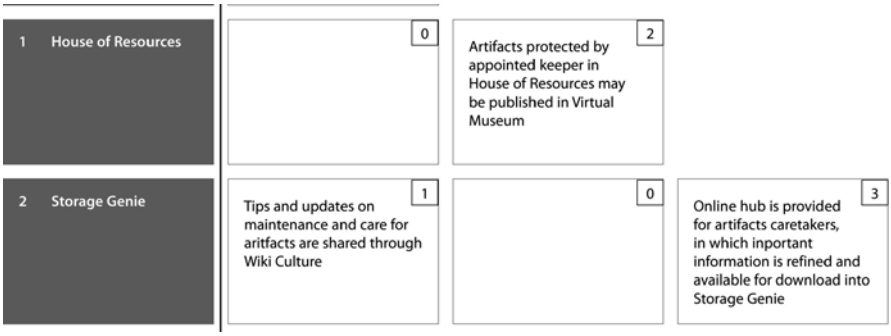

Fig. 1.14 System element relationship template

of storytelling through scenario. The team will go through rigorous process of imagining and writing up detailed scenarios for every system element.

1.4 Conclusion

Following this pilot study, further work can be done to use the documentations as a tool to communicate concept solutions and detail out a general framework to provide solutions for any culture at risk of being substituted by modernisation. This general solution framework will also be replicable for research on cultural decline conditions of other at-risk regions within Malaysia.

Acknowledgement The research was made possible through the management system and grant awarded by the Research Management Institute of UiTM.

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Chapter 2
Traditional *Keris Pandai Saras* Design

Nurulliyana Norman, Rafeah Legino, Rusmadiah Anwar, and Oskar Hasdinor Hassan

Abstract This paper aims to investigate and identify the traditional design features of Keris Pandai Saras in Malaysia. Nowadays, Malaysian Keris design is strongly influenced by Indonesian practices. However, there are also various types of Keris that are still produced in this country, such as Keris Semenanjung, Keris Melela, Keris Bugis, Keris Alang and Keris Sundang. In the new millennium, it is unsurprising that few members of the younger generation no longer understand traditional Malay weapons. There is also limited documentation available on Malay weapons such as the Keris in Malaysia, and this should be addressed. In this study, expert consultations and photographs are conducted and utilised. This research aims to identify the features of traditional, classical design and highlight the significance of Malaysian traditional weapons as part of Malaysian cultural heritage. In this study, the design proportions of the Keris are identified, and the traditional characteristics displayed in the samples of Keris Pandai Saras are classified. This study responds to the researcher's aspiration to learn how traditional designs have developed and emphasises the importance of Keris Pandai Saras to Malay heritage in Malaysia.

Keywords Keris Pandai Saras • Classical design • Tradition • Heritage • Malaysia

2.1 Introduction

Malaysia is now a developing country that is modern and advanced. However, it still conserves the richness of its natural environment, history, ethnic traditions and the multicultural diversity of its Malay, Chinese, Indian and other multiracial citizens. Intangible cultural heritage is traditional, contemporary and living at the same time, whether it be from the neighbouring village, from a city on the opposite side of the

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world or adapted by peoples who have migrated and settled in a different region. Intangible cultural heritage depends on those whose knowledge of traditions, skills and customs are passed on to the rest of the community, from generation to generation, or to other communities [1]. *Keris* are one of the intangible cultural heritage artefacts in Malaysia. A *Keris* is a tool that is used only by the Malay cluster. It is not used by any other nation in the world. A *Keris* is not only used as a weapon but also for other things. In Malay culture, a *Keris* is a special cultural artefact with a specific role [2]. The Malay people believe *Keris* have magical, powerful and mystical effects. Within *Keris* lie a very unique metal and wood technology deemed to be of very high value to society. The creation of a *Keris* involves wood crafting, fine metal art and the art of crafting weapons [3]. Wearing a *Keris* is always associated with the completeness of a Malay costume which is also related to beautiful Malay fashion and decorative arts.

In the last century, the *Keris* evolved from a royal weapon of choice to a status symbol in Malay history. The degree of elaborate designs dictated status in old Malay hierarchy. Today the *Keris* and other traditional weapons are more for ceremonial and decorative purposes and remain Malay heritage [4]. In Malaysia, we have five *Keris Semenanjung*, which are *Keris Pandai Saras*, *Keris Melela*, *Keris Bugis*, *Keris Alang* and *Keris Sundang*. This research focuses on one of the *Keris Semenanjung* – the *Keris Pandai Saras*. The *Keris Semenanjung* form is inspired by a manufacturing technique known as 'wrought Malacca' which dates back to the time of the Malacca Sultanate. *Keris Pandai Saras* immortalised the name of its maker *(empu)*, a blacksmith who came from Java and migrated to Pattani [5].

2.2 Literature Review

Research on the patterns on the *Keris Pandai Saras* has never been done by any party. Therefore, a central aim of this study is to examine the patterns of the *Keris Pandai Saras*, which is one of the *Keris Semenanjung*.

The *Keris* is defined by UNESCO as a 'Masterpiece of the Oral and Intangible Heritage of Humanity'. In 2005, Indonesia listed *Keris Jawa* as a part of their cultural heritage in rituals. It is the weapon of Southeast Asia *par excellence* and representative of a people's culture and soul [6]. The old European authors speak of the *Keris* as a poisoned weapon. In modern times, the *Keris* is certainly not poisoned, although in the past, many types of *Keris*, which were made small to economise iron, were poisoned. However, as the *Keris* got bigger, it became more difficult to apply poison as it had to be continually renewed [7].

Keris culture began on the island of Java. In Central Java, there are reliefs at Borobudur Temple (eighth century), Candi Prambanan (ninth century) and Sewu Temple (ninth century) displaying images of *Keris*. In East Java, there are *Keris* reliefs in Candi Jago (Century 13), Candi Penataran (Century 14) and Candi Sukuh (Century 14) [8, 9].

Reliefs that show iron equipment in stone inscriptions are in the village of Dukumu, the Grabag district, Magelang and Central Java. They are thought to be

inscriptions made during the year 500 AD. There are some pictures in the inscriptions in which the knife pictured is very similar in shape to the *Keris* [10].

When a Chinese adventurer named Ma Huan came on the Majapahit with the Cheng Ho fleet in 1416, he wrote in his notes that all men wear *Pulak* during childhood from as early as the age of 3. *Pulak* was referred to as *Keris*. The entry also mentions that when the *Keris* had *pamor*, the *hulu* (upper part) was made of either gold or ivory rhinoceros tusk. According to Chinese travellers' records, in 922 in Masihi, the contemporary Kuripan Government in East Java, the Javanese Emperor mentions that a short sword was presented (*Keris*) to a Chinese emperor [11].

According to Ostmeier's readings, the first *Keris* were manufactured between the years 152 and 210 of the Javanese calendar (AD 230–88). These were straight blade types, with the first sinuous blade being recorded in the Javanese year of 251 (AD 329) [9]. However, G.B. Gardner found that *Keris* are considered to be a further development of a type of stabbing weapon from prehistoric times that was made from stingray bone. The way of making this knife was to cut at the base of the stingray bone and then wrap it with a bark cloth handle so that it could be compressed and easy to carry anywhere [6]. However, Harsrinuksmo [11] says that Gardner's theory has many weaknesses, as the oldest tradition of *Keris* manufacturing in Indonesia is not present in coastal areas, but rather in rural Java [1].

Keris are not only used as a weapon; in the life of the Malays, the *Keris* plays a big role. This is because the *Keris* is deemed to have power and supernatural powers and to be sacred and respected. In palace society, the *Keris* is a symbol of power and sovereignty. The magnifying section is endowed with a sign representing the government. These signs enable the palace *Keris* and the *Keris* owned by district chiefs to differ from one another. This is because the signs imply a different level of power and rank of the wearer [12]. There are five functions of the *Keris*. These are the dominion Regalia (Royal *Keris*), an object complementary to traditional clothing and wedding costumes, medical and faith healing care, a martial arts weapon and *Keris* ceremonies [13]. For example, His Royal Highness Tuanku Raja Perlis wears a short *Keris* during coronations, ceremonies and official celebrations held by the state government. *Keris* symbolises the power of the king or sultan [14].

The actual artefacts that are exhibited by Malaysia are not described specifically, but given the agenda of the organisers and the focus on economic factors, it can be assumed that all kinds of herbs and spices would be on display plus seeds, grains and various types of craftwork. Other artefacts on display are Malay manuscripts and writing, together with Malay cultural materials such as the *Keris* and other crafts [15].

To be called a *Keris*, handheld weapons must possess *ganja* (the top of the *Keris* blade). Besides having a *Keris* blade length between 30 cm and 42 cm, another requirement includes the pattern known as *ricikan pamor*. This is a key requirement for handheld weapons to be classified as *Keris*. According to the Malay tradition, a *Keris* must be made of at least two kinds of iron and a good *Keris* of seven kinds. In *Keris*, there is an element known as *pamor. Keris berpamor* means a *Keris* which has a damascened blade. The word *pamor* means alloyed or mixed and indicates that the iron is mixed with nickel and is hence meteoric. The *pamor* patterns which

have been used over time are still a mystery. In society, there is the belief that the *pamor* pattern has magical properties. There is also a view that the *pamor* pattern represents the expression of the maker [16].

The process of manufacturing *Keris* utilises a mathematical concept. The mathematical ability involves effective thinking and conceptual learning [17]. It is believed that learning mathematics in the Malay tradition started in the twelfth century [18]. The development of mathematical knowledge in the Muslim world during that period helped to raise the standard of knowledge in areas of science and technology [19]. For example, on the *Keris*-making island of Java, the *Keris* iron is between 5 and 7 cm in length with a cross section of about 5–9 mm. It has an elliptic shape like a pencil. Bali *Keris* iron is usually longer and bigger. Bali *Keris* iron is about 9–9.5 cm in length, with a cross section of 1 cm. Artificial *Keris* from Riau, Palembang and another Malay Peninsula use iron which is short in size. The iron sizes from these areas are about 5–6 cm in length and 9 mm in cross section. In Malaysia, the *Keris* blade length is between 10 and 12 inches and is luk-shaped or straight [5].

2.3 Methodology

In this study, it is important to verify whether *Keris* is still important in Malay culture. In order to do this, the researcher attended the *Silat* competition. The researcher took photographs of those who brought *Keris* to the *Silat* competition. In this case, the researcher used a sampling design to observe the *Silat* competition in state schools in Selangor at *Sekolah Agama Menengah Rawang (SAMER)* in 2013. The sample was then divided into three groups – the participants, coaches and the audience (Fig. 2.1).

Ten states in Selangor participated in this competition – Gombak, Klang, Petaling Perdana, Petaling Utama, Sepang, Sabak Bernam, Hulu Langat, Kuala Langat, Hulu Selangor and Kuala Selangor.

According to Fig. 2.1, 542 people attended the *Silat* State School Competition in Selangor in 2013 at SAMER. From the 542 people who attended, no one brought a *Keris*. In addition, the sellers did not sell *Keris* at this competition. Even the organisers of the *Silat* itself did not bring *Keris*. This suggests that *Keris* are no longer important to Malay culture.

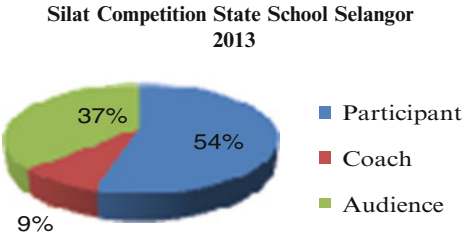

Fig. 2.1 Total number of participants, coaches and audience members by state in Selangor at the Silat State School Competition in Selangor in 2013 at Sekolah Agama Menengah Rawang (SAMER)

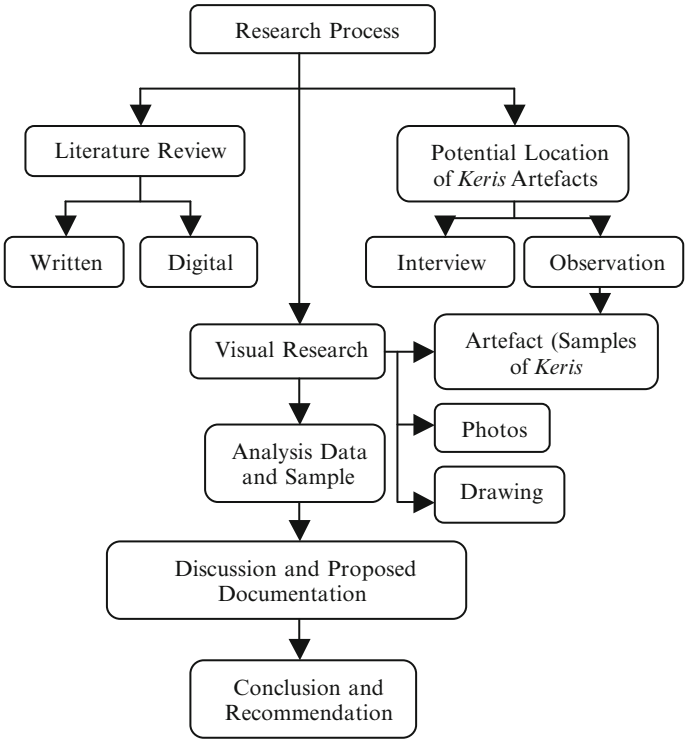

Fig. 2.2 Framework of the research process

Other than that, to achieve the objectives of this project, this study will use primary data involving interviews and observations. From the interviews, the findings will be collaborated with secondary data. Secondary data will be collected from written and digital publications (Fig. 2.2).

Review of the Literature

The literature review will provide significant information to determine the history of the *Keris*, the origin of the *Keris* and the designs related to the traditional element of *Keris* in Malaysia. The literature review will also identify other findings in the same field so as to connect with and update the literature on this area of study.

Interviews

Interview sessions will be conducted with various experts such as coaches of traditional Malay martial arts, lecturers and professors from local universities, curators from museums, *Keris* makers and *Keris* collectors. Unstructured interviews will be conducted with questions tailored to the background of the participant.

Potential Location of Keris Artefacts

Museums (National, Selangor, Johor, Melaka, Negeri Sembilan, Kelantan, Terengganu, Perak, Pahang, Kedah, Pulau Pinang), *Keris* collectors (*Senjata Warisan* and *Ahmad Toko Antik*), sellers (*Al-Hadid Keris Malela*, *Keris Ibnil Raturati, kesenian kraf melayu dan antikuiti*, Amcorp Mall), blacksmiths (*Bengkel Pandai Besi*, *Keris Kraftangan*, *Pandai Keris*), *Keris* experts (Pak Tenas @ Effendy Tengku, Mohd. Noordin Ab. Hamid) and the MHDC (Malaysia Handicraft Development Cooperation).

Observations

Observations to describe the parts of the *Keris* (the sheath, hilt and blade), the *Keris* design and the form of *Keris Pandai Saras* will be made.

Visual Research

For this study, images and photos from the cataloguing department of museums, archives, UNESCO-bank images and private and personal collections will be captured and compiled. Photographs will also be purchased when possible. A digital camera will be used to photograph and record the selected samples of *Keris*. All photos will then be transferred to the computer to enable design classification processes. Suitable software will be used to draw the shape and traditional form of the sheath, hilt and blade.

Data Analysis and Samples

The *Keris* samples will be grouped according to the design features of the blade, hilt and sheath. In the later stage of analysis, the discussion will deal with the evidence from the literature and the visual documentation of the *Keris* samples. Then, from

the samples of *Keris*, the analysis will illustrate various designs that show the continuity of decoration motifs and functions.

2.4 Conclusion

In conclusion, this article highlights the purpose of this study, which is to know and document the range of designs for *Keris Pandai Saras*, which is one of the *Keris Semenanjung*. From this research, the researcher will be able to identify the design structure of *Keris Pandai Saras*. This research project also produces a literature review, presents interview responses, identifies the potential location of *Keris* artefacts and conducts visual research, which will provide useful information related to the traditional elements of *Keris* in Malaysia.

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Chapter 3
Innovation Culture: An Evaluation of Academicians in Universiti Teknologi MARA Branch Campuses

Mohd Amli Abdullah Baharum, Sri Yusmawati Mohd Yunus, Zurah Abu, and Khairunisa Nikman

Abstract Innovation has been used as a tool in developing organisation to be more efficient and more effective. This study is undertaken to evaluate the innovation culture in UiTM branch campuses, based on the Model of Innovation (Dobni, European Journal of Innovation Management 11(4):539–559, 2008) on the following multidimensional context: innovation intention, innovation infrastructure, innovation influence and innovation implementation. One hundred fifty unsupervised questionnaires were distributed to permanent academicians in six UiTM branch campuses by using convenience sampling technique. The questionnaires consisted of part A which sought the demographic profile and part B that observed the dimensions of innovation culture which comprised factors contributing to each dimension. Eighty questionnaires were collected and analysed. The data were then analysed using descriptive statistics and ANOVA. The findings showed that organisational learning, employee's creativity and empowerment dimensions found in UiTM Dungun were the highest factors of innovation culture. This study also revealed that the level of implementation on innovation culture in UiTM was 77.5 % at this moment.

Keywords Innovation culture • Organisation • Academician

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3.1 Introduction

Innovation is an important element in any organisation in order to be a successful organisation. It has been an issue with most governments in developed countries, as promoting innovation will give a significant impact on the development of a nation. Malaysia is one of the countries that highly value innovation as one of the key factors in identifying the performance of government agencies. Based on the four pillars,– the 1Malaysia concept, the Government Transformation Programme (GTP), the New Economic Model and the 10th Malaysia Plan – it could only be a success if civil servants embrace them, use their creativity and innovation and are quick and efficient in executing the agenda [1].

Education is one of the areas that provide a major impact on the government's objectives to be a high-income country. In order to achieve this objective, innovations need to be implemented and embraced in the education process and activities. In adapting and promoting innovations, there is yet an indicator that can be used in measuring the level and the application of innovation in an organisation, especially in higher education institution. Universiti Teknologi MARA (UiTM) was trying to be established as one of the universities in Malaysia that promote innovation activities. This study is the continuity of previous preliminary studies that were done solely in UiTM Pahang. From the previous findings, it was shown that organisational learning, employee's creativity and empowerment dimensions in UiTM Pahang's innovation culture were high, while other dimensions scored moderately.

This study aimed to identify the innovation culture in higher education industry through the lecturers' perspectives in promoting innovation culture in UiTM. It focused on six factors: (a) implementation context, (b) organisational constituency, (c) organisational learning, (d) innovation propensity, (e) value orientation and (f) employee creativity and empowerment, which are parts of [7] Model of Innovation.

Problem Statement

Innovation will be one of the ways in promoting and also achieving the 1Malaysia concept, the Government Transformation Programme (GTP), the New Economic Model and the 10th Malaysia Plan. However, there is yet to be a study in the education industry, specifically in a university, in measuring the implementation of innovation culture in its teaching and learning processes. In the absence of past studies that serve as guidance, the administrator and management of the universities may not have sufficient indication on the phases of implementation of innovation culture in their institution. It will be pertinent for the institutions that have adapted innovation culture to measure the level of implementation of the culture within the institution.

Research Objectives

The objectives of this study are to:

1. Compare the implementation of innovation culture among UiTM branch campuses.
2. Analyse the difference of innovation factors among the branch campuses.

3.2 Literature Review

Innovation is an important element to achieve success. Innovation is considered as a survival strategy as it is a growth strategy for a company [2]. Innovation in an organisation goes beyond simply responding to change. It creates changes in the environment that other organisations must respond to; therefore, it can become a sustainable competitive advantage [3]. In addition, innovation as an interactive process often involves communication and interaction among employees in an organisation and draws on their different qualities from all levels of the organisation [4]. Innovation can be looked at from different perspectives. Most businesses aspire to be more innovative with their products, markets, processes and business models to achieve their strategic goals [5]. In being innovative, improvising the business process and automating the manual system are important in providing services and producing products. Innovation is one of the most often used buzzwords in the world of business today when thinking about how an organisation can grow more profitably and in a more sustainable way [5]. Innovation can be small incremental changes which are equally innovative and often overlooked [6]. Innovation on broader perspective can be explained as:

> Organizations use innovation as a term to describe many things and definitions of innovation found in the literature vary depending on the context and scope of the analysis. Some definitions are quite general – for example, to have creative employees or be market leading, and others quite specific – referring to the types of behaviours and specific roles – in the form of culture, to be engaged by employees. [7]

A successful innovation requires an in-depth understanding of the dynamics of innovation, a well-crafted innovation strategy and well-developed processes for implementing the innovation strategy [8]. A culture of innovation is important in promoting innovation in products, processes, employees, business strategies and other elements in an organisation. Innovation culture is a multidimensional context which includes the intention to be innovative, the infrastructure to support innovation, the operational level behaviours necessary to influence a market, value orientation and the environment to implement innovation [9].

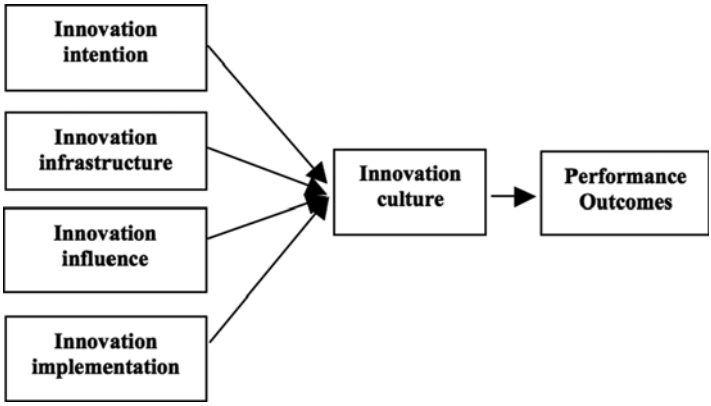

Fig. 3.1 The Innovation Model [7]

Innovation Model

The Innovation Model that was developed by [7] has identified four dimensions that structured an innovation culture in an organisation. The four dimensions are innovation intention, infrastructure, influence and implementation [7] (refer to Fig. 3.1).

Each of the dimensions contributes to different factors that influence innovation level in an organisation. An exploratory factor analysis was used in finding factors that can explain the correlations among a set of variables [7]. Reliability testing and detailed item analysis were undertaken to refine the factor measures associated with innovation culture.

Innovation Intention

The first dimension in the Innovation Model consists of two factors, which are innovation propensity and organisational constituency. Innovation propensity can be identified as a degree an organisation has formally established to develop and sustain innovation through vision, goals, objectives and operational models or processes [7]. Innovation propensity can also be seen through three aspects, which are product novelty, competitor differentiation and the use of technology [10]. The other factor is organisational constituency, which is the extent the employees are engaged in the innovation imperative and how they compare among themselves the values, equity and contributions to the organisation [7].

Innovation Infrastructure

The second dimension of Dobni's Innovation Model is innovation infrastructure, which consists of organisational learning and employee creativity and empowerment. Organisational learning factor is the degree of training and educational opportunities of employees that are aligned with innovation objectives [7]. Organisational learning uses learning orientation as "key to successful innovation-driven performance", that is, learning orientation directly influences business performance through its effects upon innovation [11]. Meanwhile, employee creativity and empowerment can be seen through creative capacity of employees and the amount of it that is allowed being expressed in their work [7]. Creative behaviours of individual employees can be coordinated, and their creative outputs and ideas are harnessed to yield such organisational-level outcomes, and yet the company would still be left without effective responses to the challenges of a competitive marketplace [12].

Innovation Influence

Innovation influence involves two factors, which are market orientation and value orientation. Market orientation can be described as market sensing and contextual awareness referred to behaviours of employees through the generation and dissemination of knowledge on customers, competitors, the industry as well as their understanding of the value chain or cluster that they operate [9]. On the other hand, value orientation is the degree to which employees are focused on and involved in the process to create value for customers [9].

Innovation Implementation

In this dimension, innovation implementation can be determined by using implementation context factors that involve the organisation's ability to execute value added ideas and ability to proactively co-align systems and processes with changes in the competitive environment [7].

Innovation in Education

During the time of continuous changes which offer no clue to the immediate future in terms of technology, business or lifestyle, innovation in education could help revolutionise our ways of thinking, entailing a radical overhaul of concepts,

attitudes and values. As such, education and training must also change, to meet the demands of a culture in which innovation becomes the universal norm.

The 1Malaysia concept, the Government Transformation Programme (GTP), the New Economic Model and the 10th Malaysia Plan could be a success when civil servants embrace them, use their creativity and innovation and are quick and efficient in executing the agenda [1]. In higher education institutions, the academicians are the ones who execute all strategic planning in the organisation. In adapting the Innovation Model, market orientation factor was not tested as the academicians only execute the decisions that have been made by the senate of the university. The factors that this research focused on are (a) implementation context, (b) organisational constituency, (c) organisational learning, (d) innovation propensity, (e) value orientation and (f) employee creativity and empowerment.

3.3 Methodology

This study focused on identifying the innovation culture in higher education industry. This was done by gauging the academicians' perspective in promoting innovation culture in teaching and learning in the UiTM branch campuses. The questionnaire used in this study was adapted from [7]. This study examined the implementation context, organisational constituency, organisational learning, innovation propensity, value orientation and employee creativity and empowerment factors of Dobni's Model of Innovation. The first part of the questionnaire identified the demographic profile of the respondents. Meanwhile, the second part of the survey was aimed to capture information related to the dimensions discussed above. The survey measured the six factors mentioned by using 5-point Likert scale of 1 (strongly disagrees) to 5 (strongly agrees).

The respondents for the survey were recruited from 6 UiTM branch campuses, namely, UiTM Shah Alam, UiTM Seri Iskandar, UiTM Puncak Alam, UiTM Melaka, UiTM Kuala Pilah and UiTM Dungun representing the east coast, north and south region for a wider distribution and comparison. The study employed the traditional method of data collection where printed questionnaires were randomly distributed to the respondents. One hundred fifty questionnaires were distributed among the permanent lecturers in these campuses. Only 80 questionnaires are valid to be used in this study as the rest was incomplete and invalid to be used for analysis. This would be one of the limitations of this study. Descriptive reporting outlined the basic findings, while analysis of variance (ANOVA) is performed to verify the findings hypothetically.

3.4 Findings

Eighty respondents were involved in this study, which were dominated by the female lecturers (78.8 %). Out of six chosen branches of UiTM, UiTM Melaka and UiTM Kuala Pilah provided feedbacks of 25.0 % respondents each while the rest of the branches – UiTM Shah Alam, UiTM Seri Iskandar, UiTM Puncak Alam and UiTM Dungun – were represented by 12.5 % of respondents. The respondents were from 11 different faculties, with the highest number of respondents coming from Fakulti Pengurusan Perniagaan (FPP) and the majority of the respondents (66.3 %) having less than 5 years of working experience. The internal consistency of the questionnaire as measured by Cronbach's alpha was acceptable with a value of 0.967. For all the factors of the Innovation Model that were being studied, the means, standard deviations as well as minimum and maximum scores were determined, as shown in Table 3.1. In general, the UiTM lecturers responded as agreed to all of the items on the factors (the mean was more than 3.55). The average mean score of the factors was 3.91, representing that the mean of innovation culture in UiTM was at agreed level among the academicians.

Next, the factors were categorised into four dimensions. The means, standard deviations and minimum and maximum scores obtained for the Innovation Model were as shown in Table 3.2.

Based on the coefficient of skewness, the data distribution collected for this study showed that it was normally distributed. Thereafter, further analysis of parametric test – ANOVA – had been conducted to verify the finding hypothetically. It was used to determine the significant difference of innovation level in UiTM

Table 3.1 Means, standard deviations and minimum and maximum scores for lecturers' response towards the factors that influence innovation level in an organisation

Factors	Min. score	Max. score	Mean	SD
Mean implementation context	3	5	4.00	0.364
Mean organisational constituency	2	5	3.68	0.538
Mean organisational learning	3	5	3.86	0.471
Mean innovation propensity	3	5	4.02	0.595
Mean value orientation	3	5	3.83	0.513
Mean employee creativity and empowerment	3	5	4.09	0.505

Table 3.2 Means, standard deviations and minimum and maximum scores for lecturers' response towards the multidimensional context

Dimension	Min. score	Max. score	Mean	SD
Mean innovation intention	3	5	3.79	0.549
Mean innovation infrastructure	3	5	3.95	0.435
Mean innovation influence	3	5	3.83	0.513
Mean innovation implementation	3	5	4.00	0.364

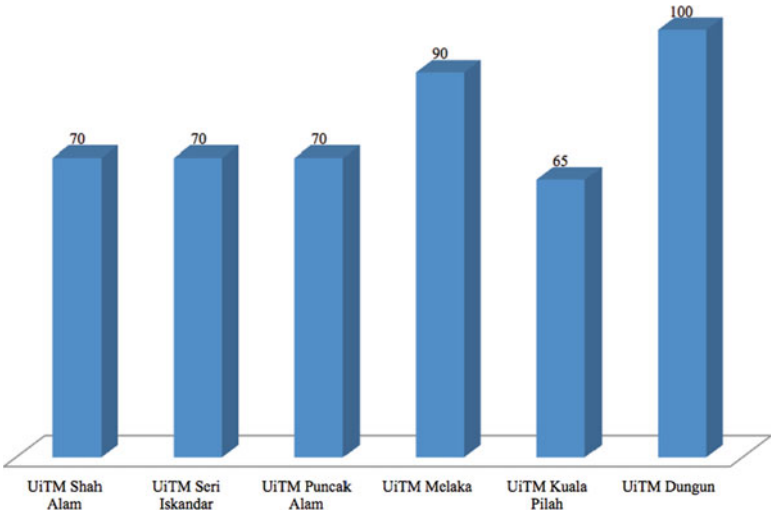

Fig. 3.2 Percentage of implementation on innovation culture among UiTM branch campuses

organisation among the branch campuses. Consequently, this study attested that there was a significant difference with p-value 0.042. The results showed that the lecturers from the six branch campuses had different perspectives on innovation culture. This study also revealed that the level of implementation on innovation culture in UiTM was 77.5 %.

Figure 3.2 demonstrated that UiTM Dungun had the highest innovation culture than the other five UiTM branch campuses. The performance level of innovation culture in UiTM Melaka was the second highest (90.0 %); meanwhile UiTM Kuala Pilah showed the lowest innovation culture (65 %).

3.5 Conclusion

Innovation is all about continuous learning that introduces something new creatively. UiTM Dungun could be used as a benchmark to other UiTM branch campuses since their organisational innovation culture was perfectly implemented. Thus, UiTM still needs to increase their innovation culture in developing and promoting innovation in the organisation. Based on the findings, then organisational constituency factors should also be supportive of new challenges and solutions in order to increase the dimension of innovation intention. Nonetheless, it is vital for the students and the academicians to have the intention to be innovative from the very beginning to encourage successful innovation culture in higher education institutions.

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Chapter 4
Microscopic Image and Text Examination of Conventional and Digital Printouts

Muhammad Yusuf Masod, Mahadzir Mohamad, and Mohd Fakharul Zaman Raja Yahya

Abstract The widespread use of printers and computers has led to an increase in the use of print documents in daily life. Mass print and automatic print quality evaluation is necessary in the fast print process to avoid the quality defect immediately when it appears. Furthermore, in many cases, print materials are dangerous tools for many criminal and terrorist acts. For instance, there were accounts of forged contracts before which led to the implementation of print identification. With the technology that is evolving for both conventional and digital printing, it is easy to lose track of the many processes and the many variables in each process. Digital printouts often appear similar. Nevertheless, comparing digital and conventional printouts can be confusing. This research aims to examine digital and conventional printouts and investigate whether digital printouts are significantly different than conventional printouts which can then be used for management and control purposes. Prior efforts to characterize digital and conventional printouts have been made. Microscopic examinations were employed in order to evaluate the printout quality and identify the source of the printouts intelligently; with the use of stereo microscope that provides a magnified view (up to approximately 20× 40×) of its edges and surface, additional information will be gathered. The print identification checklist was employed to keep track of the observations during identification. The experimental results are presented and analyzed. Based on the findings, stereo microscopic examination reveals that every printing process has its own strength and weaknesses. This revelation helps the researcher to classify the printing processes according to its potential application.

Keywords Component • Microscopic • Image • Text

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4.1 Introduction

Printing has been around since about 3000 BCE where cylinders and blocks were used. Images were first duplicated on clay blocks, and then silk fabrics, animal skin, and paper (Ronald C Baker 2012). In this era, it became a famous industry and quite important for the country based on the services it can provide. Since technology has evolved and demand for printing products grows, many printing processes exist only to provide perfection and quality on every printed product. Revolution in printing industry today enables a customer to choose which printing process is suitable for the product and produces good quality. In today's digital world, the computers and the printers are widely used. Due to the widespread of the digital devices, people may be printing rather than handwriting on many occasions, that is, producing printed documents more instead of traditional manuscripts which are dominant hard copies in people's social lives nowadays. Due to a healthy increase in printing, print quality assessment which is significant in quality examination and control is highly demanded. On the other hand, when a large part of manuscripts are replaced by print documents, most mature writer identification methods are unreliable in the areas of forensic, criminology, business, security, and so on. The purpose of this research is to (1) investigate and determine the quality from image identification and characteristics of digital printing and conventional printing printouts and (2) to investigate whether digital printouts are significantly different from conventional printouts. This research makes comparison of the quality of printed products produced by digital and conventional printing method. In addition, in many cases, print materials are tools for many criminal and terrorist acts. The scope of this research will focus on the characteristic of products printed by digital printing and conventional printing method. Every printout will be analyzed and examined in order to come up with a comparative analysis between conventional and digital printing. (1) to create a difference in every printing process because there are a digital and conventional printing process and (2) to capture the image and text clearly during conducted a stereo microscope.

4.2 Printing Process

Accordingto David Bann in *The All New Print Production Handbook* page 88, offset printing is a common method used in the printing industry, being used for a wide range of item printouts for packaging, books, newspaper, and magazines. However, the use of digital printing today has rapidly increased and this process is likely to gain shorter run work from offset lithography:

Offset Lithography

Offset lithography is a planographic process, as the printing surface is flat rather than raised as in letterpress. The area to be printed is treated chemically so that it accepts ink and rejects water, while the nonimage, or background, area is treated to accept water and reject grease. In offset lithography the inked image on metal plate is transferred to a rubber blanket wrapped around a rotating metal cylinder and the image is then transferred to the paper.

Flexography Printing

Flexography is a printing process where image printed from raised surface (relief printing). Ink is applied to the plate by a metal roller. This roller is known as an anilox roller with cells etched into it that hold the ink and transfer it onto the flexible plate for printing. During the transfer process, the ink used is a fast-drying liquid ink but the quality of the image is not as high as the quality of gravure or offset lithography.

Gravure Printing

Before the modern version of gravure was invented, the basic principle had long been applied: pictures were engraved on plates and printed on flat-bed presses. The introduction of photographic, and now digital, methods of preparing the plates and cylinders has enabled the development of the modern gravure process. Gravure printing is an intaglio process where image is recessed into the plate or cylinder, rather than being flat, as in lithography. The image consists of cells engraved into a copper, plated, or cylinder. The pressed cells are filled with liquid ink. The cells vary in depth so that they will leave the required amount of ink on the various parts of the printed image. In gravure printing, the ink is very thin and, being spirit based, dries through evaporation in a heated drying tunnel immediately after printing.

Screen Printing

Screen printing, for instance, is a conventional printing method that employs film positive and negative stencil which resemble the original image to create printouts. During ink transfer, it is forced through a stencil covered with fabric or wire mesh and mounted in a sturdy frame. Ink will pass through only in areas where no stencil is applied, thus forming an image on the printing substrate. The diameter of the threads and the thread count of the mesh will determine how much ink is deposited onto the substrates.

Ink-Jet Printing

Ink-jet technology creates printed documents with streams of ink drops that are deflected to the substrate based on information in digital files. It does not require an image carrier, or plate, and it does not require equipment like a xerographic device or a printing press. The same information can be printed throughout a print job or variable information can be printed based on the requirements of the application. The main types of ink-jet technologies are continuous jet and drop on demand.

Xerography Printing

Xerography printing relies on six fundamental steps: charging the photoconductor, exposing the photoconductor or image, developing the latent image, transferring the newly formed image from the photoconductor to a sheet of paper or other media, fusing or permanently fixing the image to the medium, and finally cleaning and restoring the photoconductor for future use.

4.3 Research Methodology

This research aims to examine and characterize digital and conventional printouts and investigate whether digital printouts are significantly different from conventional printouts which can then be used for management and control purposes. A survey instrument is used in this research based on article, journal, reference book, and using a stereomicroscope.

Microscopic Examinations

There are a few steps taken during the carrying out of the research using the stereomicroscope model scan:

1. *Steps to examine printouts using stereo microscope*
   (a) *Take*: Take a stereo microscope.
   (b) *Swift*: Swift on the button and light will be directed to the sample area.
   (c) *Adjustment*: Adjust lens till clear.
   (d) *Selection*: Take a sample of the printout and put it on the sample area to observe.
   (e) *Capture*: A sample of every printout was captured at the top of the lens.

Offset Lithography Microscopic Examination

In Fig. 4.1, the dots are arranged in regular rows and columns but vary in size where they are close to each other. The dots here look the same size. The details in an image reveal types of printing process because the main difference is in the size of the dots and the dots in uniform. Skin-tone and shadow area of an image are comprise of round halftone dots. The image is also a reproduction of details and photographs and fine-screen halftones.

Gravure Printing Microscopic Examination

The image in Fig. 4.2 showed the image consists of engraved cells. The cells we see vary in depth, so during the process, the ink is left on the printed image. In the enlarged screen above, there are differences between FM and traditional screening. The amount of ink transferred onto the paper is very thin and deep. The production of halftone dots is very precise.

Fig. 4.1 Example of the offset lithography examination (the dots are arranged in regular rows and column)

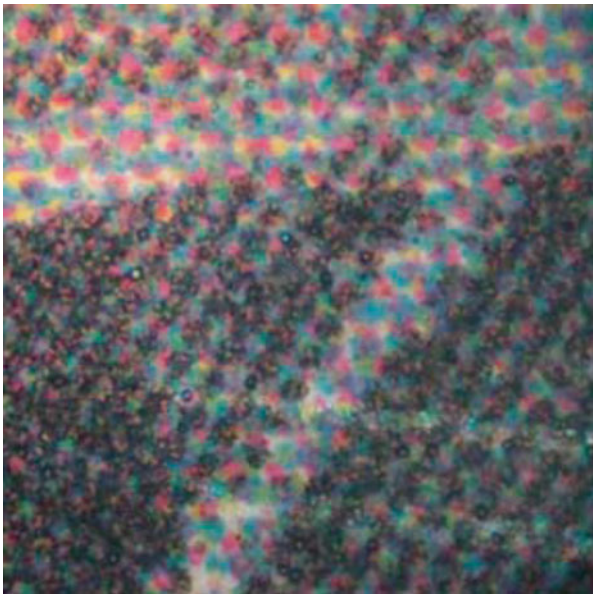

Fig. 4.2 Example of the gravure printing examination (the image consists of cells engraved)

Flexography Printing Microscopic Examination

The image in Fig. 4.3 by flexography printing appears not sharp after being zoomed. Around the image, we see more serration and the image expanded during ink transfer onto the plastic. The cells are arranged uniformly. Some cells are overlapping each other. The dots has less fine details and tendency. Elliptical half-tone dots have a tendency to create patterns. Elliptical dots meet at two different tonal values, 40 % where the pointed ends meet and 60 % where the long sides meet.

Screen Printing Microscopic Examination

In Fig. 4.4, from the image, it was analyzed that ink is spread across the screen by means of a rubber squeegee that squeezes the ink through the screen in the image. On the fabric, inked cell looked deep compared to the flattened area image. The image printed by screen printing process is heavily inked. This clearly shows the image is not sharply reproduced and it lacks fine details of the photographs. At the substrate the image is slightly raised due to the huge amount of ink applied.

Fig. 4.3 Example of the flexography printing examination (the image is more serrated and expanded from the original size)

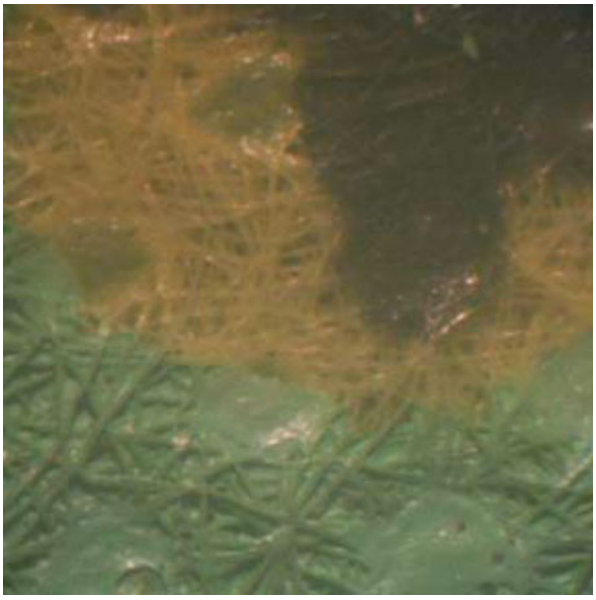

Fig. 4.4 Example of the screen printing examination (effected pleasures from rubber squeegee resulted in very deep fabric cell ink)

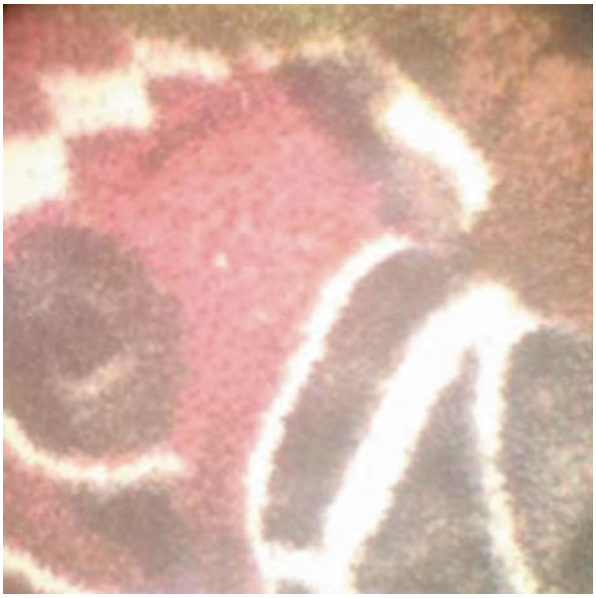

Fig. 4.5 Example of the ink-jet printing examination (every halftone dot consists of several ink drops)

Ink-Jet Printing Microscopic Examination

In Fig. 4.5, the ink-jet generally used a kind of FM (frequency-modulated) screen. The ink is sprayed out on the paper in small drops so that every halftone dot consists of several ink drops.

Xerography Printing Microscopic Examination

The image in Fig. 4.6 showed the cells are overlapping each other and at the same time there are a few unknown dots on the cell. The cells on the image are not uniformed. The dots are also in the same size and not arranged because of the powder toner used. In addition, the halftone dots become somewhat blurry. Stray dusty pigments can be seen on the paper around the edges of the dots.

4.4 Classification in Printing Process

Upon close examination, identifying print characteristics present a challenge due to the complexity of the printing process. The stereomicroscopic examination between conventional and digital printouts reveals that every printing process has its own

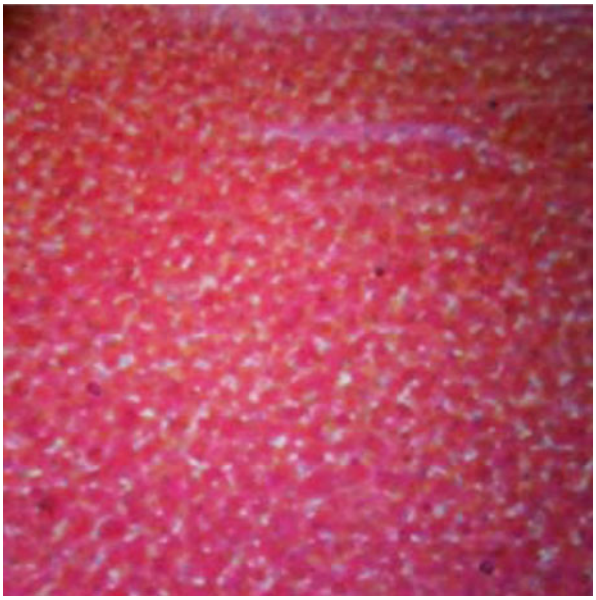

Fig. 4.6 Example of the xerography printing examination (the dot formed are not uniform) and lower details of photography)

strength and weaknesses. This revelation helps the researcher to classify the printing processes according to their potential application. The summary of the classification of printing process is shown in Tables 4.1 and 4.2.

4.5 Conclusion

The goal of this work was to adapt, use, and investigate the printed product. The quality of printouts examined by stereomicroscope and the analysis of every printed product were discussed in the previous chapter. Based on the knowledge in printing, basically offset has good-quality printed product. For instance, for high-quantity printing, offset still can achieve good quality compared to other printing methods. An examination using stereomicroscope carried out on the sample was analyzed. The offset lithography has a good reproduction of details. However, upon examination of products printed by xerography, ink-jet, or laser, their image and text reproduction is of a lesser quality compared with offset lithography or gravure printing. Gravure printing method based on the cell structure and type appears fuzzy because of the cell walls that break up the text into a fine detail. It was found on the sample analysis of the text that the darker areas of the photograph actually carry more ink as they are printed from the deeper cells. Furthermore, gravure has a greater image contrast as more ink is used. The examination proves that conventional methods still

Table 4.1 Classification in printing process

	Classification		
Printing process	Offset lithography	***Flexography***	***Gravure***
Method of image transferred	Indirect printing	Direct printing	Direct printing
Image carrier and the principle	Aluminum, planographic	Photopolymer porous	Copper, relief
Print quality	Smooth edge to text and image	Not sharp and fine-detail photography difficult to achieve	Very high quality
Print runs	4,000–15,000 sheets per hour	Small volume	5,000 per impression or more per hours
Maximum resolution	High 700 dpi	Very good 128–158 dpi	640 × 512 dpi and to 300 dpi
Substrate/maximum sheet size	40 × 60 in. (European AO)	Paper, cardboard, plastic, and metal	Up to 128 pages of 8 ½ in × 11 in. (A4)
Application	Magazine, newspaper	Flexible packaging	Cigarette box and packaging

Table 4.2 Classification in printing process

	Classification		
Printing process	Screen printing	***Ink-jet printing***	***Xerography printing***
Method of image transferred	Direct printing	Direct printing	Direct printing
Image carrier and the principle	Stencil recess	Ink-jet heat	Raised printing
Print quality	Intensive to application	Has a blocky, chunky edge appearance	Provide a sharp, intricate lettering that has a quality
Print runs	Small volume, medium volume	Print on demand	More than 1,000 copies
Maximum resolution	70 dpi	4,800 × 2,400 dpi	640 × 512 dpi
Substrate/maximum sheet size	Porcelain, fabric, metal, or cardboard manually/digital	Paper, resin coated paper, textile. Glossy paper up to 2 m (78 in)	Paper, board (15″ × 19″)
Application	T-shirt, mug	Banner and billboard	Business card

produce a good quality of text where offset achieved reproduction of detail and photography and gravure produced a good quality of image compared to digital printing. Digital, despite being a new trend in printing, unfortunately has lesser quality.

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Chapter 5
Theoretical Framework Study on Formgiving Mobile Education Game Design Technology

Nurdalilah Mohd Rani, Mohd Fairus Yusoff, and Muhamad Fairus Kamaruzaman

Abstract There has been a research on the use of mobile learning (m-learning) for primary school students, but research specifically on mobile education game design based on mind, vision, and psychomotor is still fairly under investigation. Online learning interventions have only recently included computer gaming component. Several modern m-learning approaches have begun to integrate game-based education and practice for better outcome. Hence, the proposed research represents a first step toward taking advantage of this recent technological innovation, particularly to cultivate and nurture the millennial circle which has been demoralized and depressed pertaining to the education and learning process. It is a study that demonstrates an uneven coordination in the area of scaffold m-learning, where the interest leans more toward the content point of view and very little from a mobile game-based learning or more specifically a game design's point of view. More research is needed to narrow the gap between educators, instructors, tutors, and teachers and their students with a new mobile education game design framework. The study plans are to investigate the practice in an educational game design model for millennial that will potentially assist educators, instructors, facilitators, and curriculum developers to create appropriate instrument and instructional programs to meet millennial academic needs. A mobile education game design framework for millennial development and enhancement is to be proposed from the outcome of this study.

Keywords Mobile technology • Millennials • Education • Engagement • Motivation

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5.1 Introduction

M-learning is seen as the natural evolution of e-learning; "m-Learning is e-Learning using a mobile device and wireless transmission." M-learning is the central theme at which mobile computing and e-learning coincide to emit at anytime and anyplace learning practice [1]. In a comprehensive review of the use of mobile technologies such as handheld computers, personal digital assistants (PDAs), and smartphone in learning and teaching, Kamaruzman and Zainol [2] identified aspects of learning relevant to students' use of mobile devices in both formal and informal learning contexts. In order to help them evaluate the most significant applications of mobile technologies in education, they classified these aspects into four areas which are behaviorist, constructivist, situated, and collaborative. As well as the sophistication and affordability of mobile phone technologies and its applications, it also offers a virtuous impression on the educational arena. There are tremendous research findings that show a total development toward integrate mobile phones as well as other mobile technologies to enhance the efficiency and eminence of learning via mobile learning [2]. Mobile phone is getting popular for the role as a new learning tool which is known as the m-learning. It is believed that [3] the government of Malaysia has established Multimedia Super Corridor (MSC) to forefront the seven innovative flagship applications where one of them is to execute smart school application. Nevertheless, there are still a large number of schools and educational institutions that do not use the existing technologies even though those schools are equipped with high-end technology equipments to sustain the new learning approach. The smart schools will use new curriculum for Malay language, English, mathematics, science, and others with the objective of smart school to enhance the learning quality, training, and student presentation. It is also believed that the learner will nurture the vision, mind, and psychomotor learning behavior. Teaching and learning English language have faced many challenges in Malaysia especially in primary and secondary schools. The problems mainly dwell around the contemporary learning environments, which are too stiff that edge the students' potential in their learning development [4]. Mentioned that experts strongly believe that with solid technology infrastructures, effective and meaningful information communication technology (ICT) integration in and outside the classrooms will be achievable. Most of the teachers still require more time to access new knowledge and to learn how to incorporate information technology tools in their lesson in class. One of the key problem factors faced by English language teachers in Malaysia throughout assimilation is inadequate time on their schedule for responsibility concerning to information technology. This predicament could be resolved with handy communication devices as their mobility permits training and learning to be more approachable and bestows creative opportunities for communication.

5.2 State of the Art

Mobile learning (m-learning) is an innovative educational method which contains flexibility and mobility. According to [2] "M-learning is a meadow which assimilates two major areas which are mobile computing and e-learning." The advantages of m-learning are to make content universally accessible and reachable anytime and anywhere; youngsters and adolescents adore playing and experimenting with mobile devices. It can swell and enhance knowledge retention into learning and heighten the mind, vision, and psychomotor. It is also believed that m-learning is the best method practice for the Y generation or digital age [5]. The case study on the usage of mobile device for learning shows the Y generation agrees that they have mobile freedom in accessing and understanding the learning content with 81 % of respondents agreeing with this statement. 88 % of the Y generation agreed that the application allows them to interact freely with the display and the content. A mobile lesson for learning mathematics focuses on primary school students aged 11 and 12 years old. The application using open source technology with mobile graph and can track the student progress and performance. The outcomes of this application are positive, where most of the students perform better in their examination [6].

Mobile Phone and Millennial

The Malaysian authority has dynamically encouraged the millennial to use the Internet, Wi-Fi, and mobile phone for searching knowledge and information [6]. It is believed that the usage of mobile phone in Malaysia increased drastically, and by the end of 2013, the number of subscriber is 38 million and exceeded the country's total population. Even though there are optimistic decisions from all gurus, researchers, educators, and instructors, the main challenges to execute mobile learning through mobile phones in Malaysia are still incontrovertible. The following challenges have been traced while implementing mobile learning: mistreatment, current educational guidelines, management and maintenance, stakeholders' attitude, digital divide, and personal space invasion. Malaysia is still a developing region and mobile learning is in its early stages. Mobile phone or smartphones are predicted to be used in secondary schools from the year 2016 to 2020 [7]. One of the key emerging technologies that will transform digital native in schools will be the mobile devices [8].

Mobile Game Technology as Education Learning Instrument

It is believed that mobile game technology can inspire and motivate the vision, cognitive, psychomotor, expressive, and social of individual. For many games, the only way to learn is to fail repeatedly. In the conventional educational approach, failure

has been the foremost consequence for the learners. The integration of computer games and mobile phone has been fruitfully applied to enhance mobilization and preservation [9]; they have been exposed to a flourishing learning instrument by leveraging students' passion toward m-learning and their societal relevance [10]. Mobile games can enhance an extensive acceptance and enthusiasm to the learners. But to design and execute it is not an easy task; it needs a professional to exploit playable games as part of the student classroom experience. Mobile game for learning or mobile game-based learning (mGBL) is a game specifically employed for learning which is also played on embedded devices such as mobile phone, smartphone, tablet, iPod, or handheld devices. Mobile technology is not likely to replace the teacher-student interaction but to acknowledge it. In order to provide a successful learning environment for students, both entertainment and education values should be embraced, suggesting mGBL as the possible solution [11]. Mobile game technology allows learners the freedom to personalize their own learning schedule. The accessibility of mobile devices is convenient for immediate reference and easy access. The mGBL can be adapted to the kinds of information being presented, whether it is in wording, visuals, video, and graphics. Generally, the mGBL are designed in order to balance the subject matter with the game play and the ability of the player to maintain and utilize the said subject matter to the real world. The use of technology in education has had an optimistic impact to the scholars, educators, gurus, and instructors as well as the educational system as a whole. Many optimistic impressions have been observed by experts and officials in the field. Video games very related to constructivist principles can be used to encourage students to engage in recreation active roles and learn through practice rather than fact memorization. Mobile game is a convenient way to study using casual learning and should have a challenging inimitable balance. The components in designing the game are the illustration of formal system, interaction of actions, conflict in obstacles, and real-life experiences [12]. It is also believed that fine games dynamically engage players in the experience through their deed and decisiveness [2]. The heuristic assessment plan for mGBL is necessary for formative the efficiency of the formed media. The stratagem of assessment consists of four components: game usability, mobility, game play, and content.

5.3 Research Design and Methodology

Theoretical Analysis

A computer search was performed using online databases from ScienceDirect, Scopus, and Emerald, Design Studies Journal, Materials and Design Journal, and International Journal of Design.

Professional Discussion

One professional advisor will be interviewed in order to bestow pragmatic data from school educator and instructor. The main intention of this activity is to discover mechanism, stages, and steps involved in mobile education game-based learning for millennial.

Form Plan

A conceptual formgiving model will be designed as a mode to validate the effectiveness of proposed model for mobile education game-based learning development applying new dynamic visual and multimedia elements as a base. This prototype will be used to nurture and enhance the cognitive, vision, and psychomotor of the millennial.

Experimental Study

It will be executed on an actual assignment to quantify the realism and expediency characteristic, and therefore this can assist for authenticating the planned design guideline model [2]. Questionnaires will be used in this investigation as an approach to obtain feedbacks from various respondents including parents, family members, teacher, and experts. Interviews were tape-recorded in order for researcher to analyze the respondents' behavior, reaction, and response [13]. The interview issues were constructed on the foundation of state of the art. The evaluation will take place at the secondary school in Klang Valley, Malaysia.

5.4 Significance and Uniqueness

This study is inimitable because it incorporates mobile game technology and theories of cognitive to structure a framework to construct a mobile education game design. This model will be very useful and beneficial for the millennial that has been demoralized and depressed pertaining to education ambiance and learning process prodigy.

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Chapter 6
Anthropomorphism in Political Cartoon: Case Study of the 1965 Malaysia-Indonesia Confrontation

Azahar Harun, Mohamed Razeef Abd Razak, Ariff Ali, Muhammad Nur Firdaus Nasir, and Lili Eliana Mohd Radzuan

Abstract This research sets out to examine a political cartoon that focuses on the 1965 Malaysia-Indonesia Confrontation or better known as "Ganyang Malaysia." Created by an anonymous artist, the cartoon represents the late Indonesian President Sukarno as an anthropomorphized "Ayam Jantan" (a rooster) crowing at the hill of the Federation of Malaysia. Using Saussure's semiotic analysis as research method, we attempt to extract the visual elements and interpret its latent meaning in relation to the issue. The findings suggest that the political cartoon under study possesses a strong metaphor that links to a classic Malay proverb "Bagai ayam sitombong, kokok berderai-derai, ekor bergelimang tahi" (Like a rooster that crows a lot but its tail is smeared with its own droppings) which means a person who likes to boast about himself but could not cater for his family. In relation to this, it is also discovered that the anthropomorphic caricature is not only intended to ridicule the confrontation issue but could also be seen as a protest toward Sukarno's controversial foreign policy.

Keywords Anthropomorphic caricature • Political cartoon • Semiotic

6.1 Introduction

As far as diplomatic relations are concerned, it could be considered that Malaysia and Indonesia are like siblings. The fact is that there are many commonalities which both countries share particularly in terms of geography, economy, religion, cultural arts, and

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political history. In spite of this, in reality, this so-called sibling relationship between Malaysia and Indonesia is not always in the best state. Scholars in psychology note that sibling relationship is much more challenging compared to other kinds of relationship (Burhmester and Fuhrmen 1990, cited in Jan Blacher and Gazi Begum 2011) [1]. Perhaps this is why countries such as North Korea-South Korea, India-Pakistan, China-Taiwan, and Iran-Iraq are still struggling to overcome their differences.

In the case of the Malaysia-Indonesia relationship, apparently there are many diplomatic issues which have yet been resolved. Recently, an Indonesian extremist group BENDERA *(Benteng Demokrasi Rakyat)* had launched a provocative campaign called "Sweeping Malaysia." According to an online report, BENDERA has openly declared war, and the group is said to expel Malaysians who reside in the country. In addition to that, BENDERA also claims that Indonesian people are "ready to storm Malaysia even armed with indigenous weapon such as bow and arrow." This provocative campaign was linked with several issues concerning Indonesia's sovereignty, which BENDERA claims Malaysia has violated. J. Saravanamuttu (2010) highlights some of the incidents pertaining to BENDERA's act of protest that includes the issue of illegal workers and migrant, the beating of Indonesian karate contender by alleged Malaysian policemen during the Asian Karate Tournament held in Negeri Sembilan in 2000, the issue of "Tarian Pendet" or the Javanese traditional dance and the national anthem "Negaraku," and the claim of Sipadan and Ligitan islands in the south of Sabah [2]. The feeling of uneasiness among Indonesian people toward Malaysia actually has rooted since the reign of the late President Sukarno. In the following text, we will discuss how the conflict began.

6.2 History

According to Malaysian history, in July 27, 1963, Indonesia's President Sukarno had openly protested the formation of the new Federation of Malaysia. Apparently, he was angry because Malaysian Prime Minister, Tunku Abdul Rahman, had declared the formation of Malaysia in 1963 before the United Nation officially released the result of public's opinion from Sarawak and Sabah. Tunku's action was seen as an insult to Indonesia and perhaps also to Sukarno himself. In a public rally, Sukarno vowed in front of his people that by January 1, 1965, he will literally crush Malaysia. Thus, a campaign called "Ganyang Malaysia" was declared. According to Greg Poulgrain (1998), the protest was driven by Sukarno's expansion ambition to reclaim territory that was formerly under the Dutch colonial rule [3]. As a result, tension especially at border area between two countries had escalated. Despite Sukarno's offensive decree, in reality, the actual war never did happen. Instead, according to Poulgrain, "small-scale skirmish guerrilla tactics" took place in the border area (Sarawak and Johor), but the mission "failed to overturn or disrupt the integration of Sarawak and Sabah into the Federation of Malaysia." Ironically, Indonesian authorities denied any involvement and blamed "enthusiastic idealists" for carrying out the operation independently. The flame of anger which Sukarno had

fan through "Ganyang Malaysia" campaign slowly diffuses itself as Indonesia was forced into a major economic crisis. On March 11, 1966, Sukarno signed an executive order transferring his authority to the army led by General Suharto (Gross 2006) [4]. Under Suharto's leadership, Indonesia took a 180° turn looking at the economy as the important national policy and silenced the anarchic politics of Sukarno. Then on August 11, 1966, Suharto presided over a peace treaty that was held in Jakarta. The Deputy Prime Minister of Malaysia, Tun Razak Hussein, and Indonesian Foreign Minister, Adam Malik, signed the treaty. The signing of the treaty marks the end of the 1965 Malaysia-Indonesia Confrontation.

6.3 Problem Statement

The provocative "Ganyang Malaysia" campaign launched by Sukarno had captured the attention of the press media from both countries. In *The unfinished business between Indonesian and Malaysian: Indonesia media perspective of Konfrontasi*, Rudi Sukandar (2010) reports that from 1963 until 1964, three influential Indonesian magazines, *Harian Merdeka*, *Pancasila Magazine*, and *Antara Weekly Review*, have aggressively published articles pertaining to the confrontation [5]. Similarly, in Malaysia, several documentaries about the confrontation were also produced by Filem Negara Malaysia (FNM). In relation to this, perhaps the most controversial one was a political cartoon drawn by a local anonymous artist. The cartoon is a black and white hand drawing (14 cm × 16 cm), and it features two representation subjects. The first subject portrays an anthropomorphized creature (half human and half rooster) and the second subject portrays the Federation of Malaysia (see Fig. 6.1). The cartoon is

Fig. 6.1 A political cartoon of the Malaysia-Indonesia Confrontation era

published in the *Encyclopedia of Malaysia: Government and Politics* and can also be retrieved from Arkib Negara or the National Archive center.

Aside from the use of anthropomorphic caricature, another important element found in the drawing is a slogan that reads "SA-BELUM SATU JANUARY MALAYSIA AKAN DIGANYANG" which translates: Before January 1, Malaysia will be crushed. The slogan that seems to emerge from the caricature's mouth significantly marks the turning point for the diplomatic relationship between Malaysia and Indonesia.

As far as this study is concerned, surprisingly, there has been no research about the political cartoon of the 1965 Malaysia-Indonesia Confrontation, thus creating a gap in the history of Malaysian media. Hence, the following questions are posed:

1. What are the signifier and signified components exhibited in this cartoon?
2. What is the significance of "Ayam Jantan" (rooster) in relation to the confrontation issue?

In order to answer these questions, the study attempts to encode and decode the meaning embedded in the political cartoon. This will be discussed further in the Method and Analysis section.

6.4 Method and Analysis

The method used in this study is referred as semiotic analysis, which is founded by a Swiss linguist, Ferdinand de Saussure, in 1966. In *Media Analysis Techniques*, Arthur Asa Berger (2005) states that semiotic analysis concerns the study of sign and interpretation of its latent meaning. Since visual is also a sign that carries meaning, thus semiotic analysis can be applied to anything, in particular those that "involves or are concerned with communication and the transfer of information" (p. 5) [6]. In *Semiotics: The Basics*, Daniel Chandler (2002) states that Saussure puts emphasis on two divisions of sign, that is, signifier (sound or image) and signified (concept) [7]. Saussure states that these two divisions cannot be separated but depend on each other in order to form meaning. In this sense, the signifier is considered the primary meaning while the signified is the secondary meaning. Saussure theorizes that a visual (symbols, image, illustration) possesses a characteristic that contains a signifier which is essential to form the meaning (Berger 2005) [6].

Before the analysis task could be carried out, first, the artifact had to be broken up into individual visual subjects. To execute this task, we had to trace the outline of the drawing using a stylus and a digital tablet. The aim here is to omit the detailing (texture and shading) so that focus could be given on the visual form. Next, an open coding approach is used which is done by indentifying, naming, and tagging each of the visual subjects with numeral code. From this process, we were able to extract six (6) different visual subjects (see Fig. 6.2).

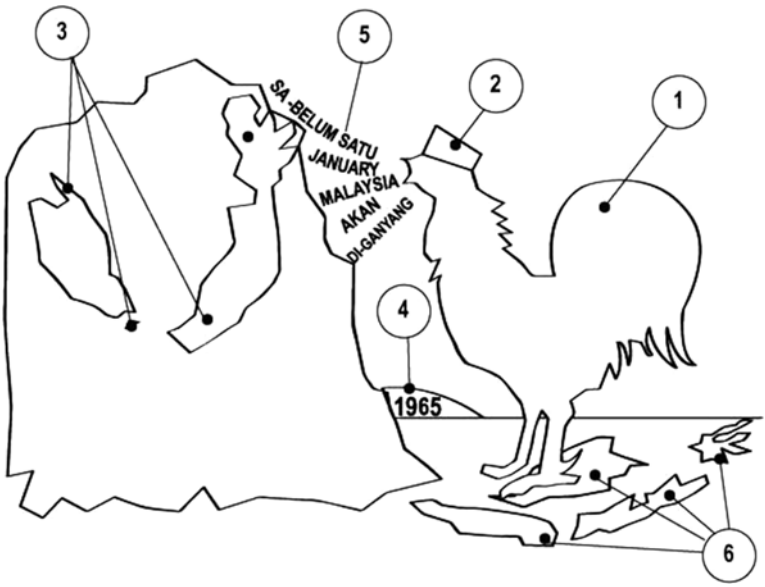

Fig. 6.2 Visual subjects found in the artifact

Anthropomorphized Rooster

The illustration of an anthropomorphized rooster found in this cartoon signified threat. This is noticed through the depiction of spur and physical form of the fowl. In Indonesia and Malaysia, a rooster is a special fowl and often bred for fighting and gambling. The game is bloody and may end up with serious injury or even death.

Songkok (Traditional Cap)

"Songkok" is a traditional cap, which is commonly worn by Indonesian and Malaysian gentlemen. In addition to that, "Songkok" can also enhance one's personality and status in society. As shown in the political cartoon, the character depicted wearing "Songkok" is meant to suggest Sukarno's identity.

Malaysia, Singapore, Sarawak, and Sabah

The illustration of Malaysia, Singapore, Sarawak, and Sabah is portrayed as a hill which stands firmly on the ground. This formation signified unity and superiority.

The Sunrise and the Year 1965

The illustration of sunrise symbolizes hope, and the year 1965 printed inside the sun signifies new era.

Slogan

The slogan "SA-BELUM SATU JANUARY MALAYSIA AKAN DI GANYANG" is a propaganda which is meant to ignite the feeling of patriotism among Indonesians and to intimidate Malaysia.

Island of Indonesia

The illustration of Indonesia (Sumatera, Java, Borneo, and Kalimantan), which is represented as patches, is dwarfed by the sheer size of Federation of Malaysia (including Singapore, Sabah, and Sarawak) and thus symbolizes inferiority.

6.5 Results and Discussions

Politically, the cartoon is provocative but cynical at the same time. Its main purpose was to deliver the message that Indonesia being the so-called Ayam Jantan should not be underrated, and if so, Malaysia will have to face a brutal punishment through its sharp claws and spurs. In another perspective, it was also an attempt to satirize Sukarno's political view. Regardless of whatever assumptions it may offer, perhaps the most interesting part about the cartoon is how the artist conveys the issue of exploited anthropomorphism. The portrayal of Sukarno as half human and half fowl (anthropomorphic) is straightforwardly incongruous and absurd. Then again the question is why the artist chose to depict a rooster? The truth is that a rooster has a significant symbolic representation in Malay culture. According to Lim Kim Hui (2010), it is common in Malay culture that animals are described as analogy in classic Malay proverbs [8]. Kim Hui observes that among the three hundred and twenty six ($n = 326$) of common animals found in Malay proverbs (Abdullah Hussain 1991), the fowls are on the top of the list with 54 entries [9]. Kim Hui asserts that fowl and water buffalo are the "closest friends to the paddy farmers" (p. 62). This is because the fowl acts as the alarm clock to wake up the farmer in the early morning, whereas the water buffalo functions as a tractor that is useful for plowing the paddy field. Despite the positive values associated with fowl, Kim Sui also argues that there are some negative analogies that are commonly used by the Malay people.

Consider the following examples: "Ibu Ayam" which refers to a hen actually means a woman who acts as a go-between for prostitutes, "Bapa Ayam" or rooster refers to an unworthy father, "Hangat-hangat tahi ayam" (as hot as fowl's droppings) means not doing something wholeheartedly, and "Cakar Ayam" or the scratching of chicken means poor handwriting. Most of these examples are meant to compare and associate the characteristic (physical and behavior) of the animals to the real person. As what Wan Abdul Kadir (1993, p. 27) puts it, "The Malays can understand the behavior of animals around them. That animal behavior is then used as insinuation towards human. One who compared to certain kinds of animal can understand its meaning. This symbolic expression has become part and parcel of the Malay culture inherited for quite some time" [10]. Regarding the image of the rooster as depicted in the political cartoon, the study also found two possible proverbs that reflect the situation. The first is "Ayam Menang Kampung Tergadai" (Rooster wins, but the whole village loose), and the second is "Bagai ayam si tombong, kokok berderai-derai, ekor bergelimang tahi" (Like a rooster that crows a lot but its tail is smeared with its own droppings). In this case, we argue that the second proverb is more suitable to be considered. Despite Sukarno's menacing image, his act was merely an oral exercise. On the other side, Malaysia, which is featured as a hill, stands firmly on the ground. She is an inanimate subject, which means she does not respond to the crows. There is a Malay proverb which suits this situation as well, for instance, "Anjing menyalak, bukit takkan runtuh" (A dogs barks, hill will not crumble). According to Imran Ho Abdullah (2011), this particular proverb depicts two binary opposition subjects: "Anjing" (dog) which is an antagonist (bad person) and "Bukit" (hill) that refers to a protagonist (good person) [11]. In addition to that, we would like to highlight another important subject in the proverb that is the word "menyalak" or barking. Generally, in Malay culture, the word "menyalak" is commonly used as a figure of speech, which refers to someone who makes a loud noise for the sake of attracting attention and annoying others. This kind of act is seen as a worthless effort, and the noise produced by the person is often ignored because it lacks truth and credibility. Similarly, the slogan that reads "SA-BELUM SATU JANUARY MALAYSIA AKAN DI GANYANG" can also be regarded as nothing but an irritating noise. Perhaps the artists intended to show that although the slogan may sound forceful, it will not cause serious damage to the Federation of Malaysia because it comes out from the mouth of a strange-looking personality.

6.6 Conclusion

This study has shown that anthropomorphism has the potential to play an effective role in political cartoon. In the case of the 1965 Malaysia-Indonesia Confrontation, we found that the political cartoon is not only rare but is also highly valuable particularly in terms of Malaysian political history and Malay culture. Based on the semiotic analysis findings, we conclude that the use of anthropomorphized rooster and the depiction of Federation of Malaysia as a hill provide a cultural perspective

about the confrontation issue. The late Indonesian President Sukarno is portrayed as a vocal and furious "Ayam Jantan" that is ready for a bloody fight. On the other hand, Malaysia, which is depicted as a hill, seems to be silent but stands firmly and strong. The sheer size of Federation of Malaysia in comparison to the patches of Indonesia (Sumatra, Java, Borneo, and Kalimantan) thus implies that she is not easily intimidated by the war cry uttered by Sukarno. Overall, the incongruity of the anthropomorphic caricature found in the 1965 Malaysian-Indonesian Confrontation political cartoon does not only ridicule Sukarno's foreign policy but also provokes emotional response and invites cultural as well as intellectual debates.

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Chapter 7
Developers' View: Understanding the Importance of the Courseware Interfaces as Part of the Software Development Process

Norfadilah Kamaruddin

Abstract The success of computer software is based on a series of structured development activities that have been formulated into development process. Towards that, understanding the importance of the courseware interfaces as part of the software development process among the developers is also important. Thus, a study was conducted in Klang Valley to determine the courseware developers' view by gathering their understanding on the importance of interface design towards the development process. The investigation was conducted through two methods: a contextual document analysis and face-to-face interviews with the courseware developers. Findings have revealed that the developers largely ignore the importance of user involvement and prototyping methods as recommended in the international literature in current development process.

Keywords Development processes • Interface design

7.1 Introduction

The software development process can be described as a development life cycle. In order to manage and ensure the success of computer software, a series of structured development activities has been developed over many years, and these have been formulated into development processes. Throughout the literature, a variety of systems development models can be found, and each outlines detailed structures and processes and a variety of activities that are closely linked. While many models are acceptable, depending on the circumstances and the goals of the product, it

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should be noted at the outset that variant approaches impact on aspects of the outcome [1–3]. Therefore, an appropriate development model should provide the developer with a systematic, well-disciplined and practical approach to the design, development and maintenance of the software.

Concerning this, interfaces have played an important role in presenting the real info of the computer software. As a tool of communication between the users to interact with a system in the delivery of particular information, the term interface design for an interactive multimedia application particularly does not just simply refer to a font size, a button placement or the images that the user sees and feels but includes every element of a system such as screen layout (consists of the shape of buttons, the positioning of menus, the display of a warning message, the colour applied) and selection modes of interaction. However, most of the courseware developers assume interface design as only a simple thing in the process of courseware development, and consequently, quality courseware will not be achieved due to the weak quality of interfaces [4]. This situation can occur if courseware developers really have knowledge of the interface design function. This also can actually be addressed if courseware developers refer to the principles and guidelines developed by experts in the field of interface design and experts in the design of multimedia instructional materials. Thus, based on this understanding, a study was conducted in Klang Valley to determine the developers' view by gathering their understanding on the development of interface design towards software development process. The investigation was conducted through two methods: a contextual document analysis and face-to-face interviews with the courseware developers.

7.2 Interface Design Within the Development Process

There are three classic development models established in the literature. And because this research project focuses on interactive courseware for educational purposes, a well-known instructional system development model that is identified in the literature has also been reviewed. This includes then: (1) the classic waterfall model, (2) the iterative model, (3) the spiral model and (4) the ADDIE model for instructional system development. Within all of these models, software developers and educators commonly work together to generate the learning content, formulate the learning activities and assessment strategies and determine the feedback on the developed software. The common processes applied throughout these four models include analysis, design, development and testing, and evaluation.

No matter which development process is used, the design and production of the interface are particularly important, because users tend to rate the usability of a product on its interface design performance. This is because the interface is their first contact point [5], and users will tend to make judgments on first impressions, which are created by the interface rather than functionality [6]. Indeed, many products are never used because potential users never get past the initial interfaces [7]. Besides, establishing the look and feel of a product (which should balance an

expression of the product 'identity' with the sensibilities of the target group of users), there is considerable agreement in the literature that effective interfaces are those that are easy to use and which enable users to achieve their goals in the context of product use [6]. The development team must decide how users will interact with, and navigate through, the software system and choose appropriate methods within the interface to provide instructions to users and provide multiple types of feedback. Thus, courseware developers need to consider how the interface design affects users' experience, as well as which elements and principles need to be incorporated in a particular context and for a particular audience.

Given this complexity, interface design can be viewed as a complete systems design process in its own right. As [8, 9] argue, interface design is not something that can take place late in the development process after all the important decisions have been made but is something that must be continuously addressed throughout the process, usually by a specialist interface designer in the development team. And to develop an effective interface, a detailed understanding of the users and their needs is required, which should involve as one of stakeholder consultation in the design process itself.

7.3 Understanding the Current Malaysian Practices of Interface Design Production in the Software Development Process

To understand the current practice of software development process in Malaysia against the international views, 10 courseware developers were interviewed throughout Klang Valley. Interviews moreover have determined that five particular steps are being practised, which are similar to those most commonly referred to in the literature, which is the waterfall model. They include the requirements and planning stage, analysis stage, design stage, development and testing stage, evaluation and feedback stage and, finally, the delivery and implementation stage. Moreover, they also initiate a requirement and planning phase up front and include iterative phases in the development stage and evaluation stage to refine the courseware. This courseware development process is visualised and compared to the waterfall model in Fig. 7.1.

However, it is important to clarify that the identified differences from the waterfall model (the inclusion of a requirement and planning phase and an iterative phase) do not bring the process in line with the spiral, iterative or ADDIE models. Firstly, while the interviews revealed that most of the Malaysian courseware developers (8 out of 10) initiate a requirement and planning phase up front, this includes (1) details of a development work schedule, (2) tasks to be accomplished by the development teams and (3) the scope of work to be done, and the project manager usually considers factors such as the capability of the team, the budget constraints and completing the task within the given time frame. This detailed and

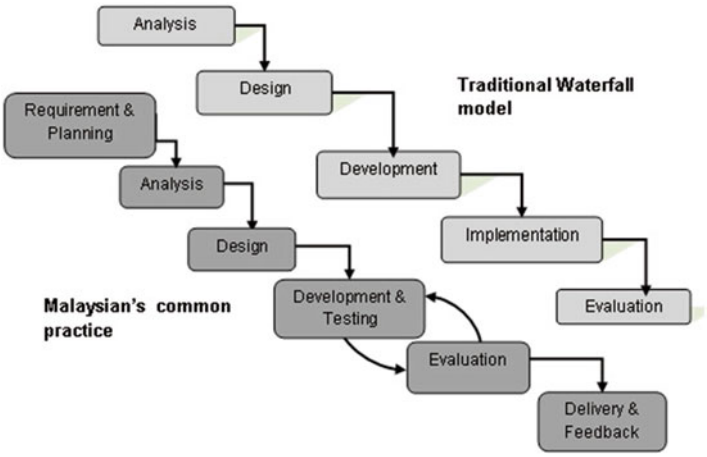

Fig. 7.1 A comparison of steps in the development process in the waterfall model and the current development practices in Malaysia

careful planning therefore does not include a user needs analysis but only an analysis of the ministry guidelines. Secondly, while the process includes iterative phases in the development stage and evaluation stage to refine the courseware, the interviews revealed that the iterative phase is not entirely similar to the iterative process suggested in the spiral, iterative or ADDIE models in which, if an error or mismatch is noticed at any phase of the project by target group feedback, the previous stage is repeated from the beginning. In the current practices of developers in Malaysia, a revision process only occurs if an error is revealed within the development and evaluation stages. The reason provided by the participants is that to make changes then is less time consuming and expensive than the ADDIE model where a change means a total rework. Moreover, the changes are based on internal reviews and requests by the ministry only. No testing is undertaken with user groups, so changes are not based on their feedback. In this regard, it can be concluded that the iterative process being practised by the developers in Malaysia is simply to ensure that all ministry requirements are signed off, rather than to produce a product that optimally fulfils end-user needs.

According to the literature, there are three types of analysis that must be conducted before the design process begins: a user needs analysis, a product analysis and a systems requirement analysis. However, it became clear in the interviews that no participants indicated that they conducted a user needs analysis before starting the design process. Almost all project managers and their development teams simply conduct an analysis of the tender documents and the guidelines provided by the ministry. As explained by the participants involved, this involves focusing on specific media requirements and instructional specifications in the ministry's guidelines. Further information is gathered from printed textbooks and other relevant sources in

order to achieve the requirements of these specifications. When asked specific questions about why a deeper understanding of the user is not sought, various responses were given. One project manager argued that it is unnecessary, based on the assumption that these needs were understood in advance. He stated that *We are the developers of the interactive educational courseware so we should know the basic requirements of the courseware. So I don't think we need to do a user needs analysis* (Respondent 2). Other developers cited various pragmatic reasons relating to access to user groups, budget and time. These broad issues are encapsulated by one of the project managers who stated: *According to the contract, the period of time to complete the courseware is one year. But then, if you can see, it is not a one year project. In actual conditions we have only 8 to 9 months to finish the project. So we have to speed up … If you conduct a needs analysis with the user, it will take more time. It is not easy to get permission from the school principal to enter their school. It will involve more additional work and will take you several months to get permission even though they are in the same ministry. Our concern is to complete the process of the courseware development as early as we can, so that we can move on to another project* (Respondent 3). Another raised schedule constraints in another way, saying that *So far, we haven't yet conducted a user needs analysis with the students. This is because we are familiar with the Ministry project. We also don't have time to concentrate on that because we are not only taking jobs from the government. At the same time we also have to complete other jobs* (Respondent 1).

In relation to the other critical point at which user input is recommended in the literature, namely, user testing during and after the design and development phases, the interviews clarified that this does not occur either. The participants reported that the only testing to occur is within their own production team. This testing is performed to ensure that the interface design of interactive courseware has been developed in accordance with the specifications and that it meets the requirements in the tender documents and guidelines received from the ministry, as well as perfecting the functionality of the courseware by identifying bugs. As exemplified by one of the project managers, *When the lessons are completely designed, in house testing will be conducted by a team leader from each of the different departments. Usually during this process we will make sure that all the functions are working properly. For example, if the voice said "this is a ball" the arrow must be pointed towards the ball not other things* (Respondent 1).

Clearly, the developers try to implement the requests of the ministry. As one commented, *We conduct product testing but only among our team in order to determine the weak points of the courseware, and we modify it before sending it to the Ministry. Generally, this testing is primarily focused on evaluation of the courseware functionality* (Respondent 3). However, this dependency on the ministry guidelines and oversight mean that the developers feel that they do not need to take responsibility for any deeper understanding of the users, their needs or broader design aspects such as the interface design. As one project manager summarised, *Actually, the authorization of decisions, especially on interface design, is in the Ministry hands, not ours* (Respondent 4).

This suggests that the developers do not consider it part of their role to undertake user testing, as the ministry has ultimate responsibility for quality and what defines it. In summary, the courseware developers do not consider end-user involvement necessary or possible within the time frame nor their responsibility. However, self-claimed familiarity with the tasks required is not enough to ensure that the interactive courseware is embraced by end users. As the literature has established, compared with other models of software development, such an approach carries with it a high potential for deficiencies in the content, interface and interaction design of software products.

7.4 Perceptions of Learning Concepts Among Courseware Developers

As has been established, through reference to the literature, the success of interactive courseware depends on courseware developers having not only an in-depth understanding of the role of interface design (which is crucial in ensuring that users can interact effectively and find what they are looking for efficiently) but also an understanding of the users' needs in terms of the role of the courseware. However, the interviews revealed that most (8 out of 10) developers who participated in this research project lack an in-depth knowledge of the principles of interactive learning. However, instead of taking the initiative to learn pedagogical frameworks, they rely on the guidelines and requirements of the ministry, along with general principles for software design and understandings gained from prior involvement in the development of other types of interactive material such as corporate videos and multimedia presentations. This is illustrated by a project manager's response that *We just develop it based on our previous experience* (Respondent 2). The assumption that this is adequate is revealed in the comment of another developer that *There is not much difference when you are preparing digital learning material. The difference is just a platform of delivery. But at the end of the day, it depends on the user. Either they like to use it or not…it is just about preparing the look of the product* (Respondent 4). Yet, designing interaction and interfaces for the courseware is a very different task to generate software, and it is not just a matter of developing interesting graphics and presentation by combining multimedia elements. Interactive courseware has emerged as an instructional technology with the potential to overcome limitations of traditional media and provide the prospect of engaging learning environments with strong visual and interactive elements. Therefore, an understanding of this potential, as well as the understanding that each piece of learning material has different user needs and contexts, is essential. Reliance on previous experience from different contexts appears to have led the majority of courseware development teams involved in the courseware for the Malaysian *Smart School Project* (9 out of 10 developers) to assume that the development of educational courseware simply requires an 'improvement' process, which involves converting a

printed version of course material into an electronic format. One participant demonstrated his understanding of the difference by this response: *Designing interfaces for the computer screen is different from printed design. You cannot simply prepare the interfaces without having some understanding about the overall concept* (Respondent 3).

However, as another, more representative, informant said: …*Sometimes we just convert the sample test from the existing textbook into the interactive courseware. It's easier than spending a long time on analysis of the requirements* (Respondent 2). Designing effective interfaces for interactive material is not only a matter of transmitting information between the computer and individual through graphic presentation and the inclusion of multimedia. Interactive courseware should create experiences for the user that provide them with capabilities, engage them in activities and create a desire to continue to use the application – all in the interests of ensuring that they understand the educational material presented. By revealing that developers simply convert printed material into a digital format, albeit with multimedia components, the responses gathered in this study suggest that the courseware may fall short in terms of this potential.

7.5 Discussion on Identifiable Issues with the Current Interface Design Production in Software Development Process and the Skills of Developers

Various factors have been put forward by the developers throughout the interviews. The most common reasons for the lack of consultation is that they are familiar with the project and the needs of the ministry, that they are given limited time to complete the scope of the project (i.e., the cost and time constraints imposed by the ministry on the developers preclude a consultation process which would be time consuming) and that access to end users is difficult. Moreover, what has also become evident through the interviews is that the courseware developers think that their primary objective is to meet the ministry's requirements and specifications and that they do not have the agency to, or responsibility for, understanding the users' requirements. It is understandable that they assume that this is the ministry's obligation, if the guidelines are presented as comprehensive and binding.

Another phenomenon identified from the interviews is the lack of pedagogical knowledge and understanding of interactive learning concepts among the courseware developers. This is due to the designers in the development team having no experience of, or training in, teaching. However, the courseware developers do not feel an obligation to contribute pedagogical knowledge to the process of interface design production because the content expert in the ministry team provides instructions and presumably contributes to the guidelines. However, this expert does not work with the development team through the process and is geographically and structurally dislocated from the development team.

The contribution of expertise from different fields is particularly important when developing content for educational courseware. System engineers, programmers, graphic designers, writers and editors must integrate educational material. While curriculum and content might be provided by an educational specialist, also required is expertise in developing effective interfaces for students' and teachers' needs. That is, the development teams in Malaysia not only need a content expert actively involved in the design but also require an instructional designer who has an understanding of learning models/theories for the effective development of interaction and interface design that engages students with content and facilitates effective testing and feedback. Accordingly, the active involvement of a content expert and an instructional expert to the development team not only helps identification of requirements but also contributes to more effective performance of the courseware. The dislocation of the content expert and instructional designer from the development teams may be attributed as a potential source of conflict and communication issues between the ministry and courseware developers, but it is also likely to be a key reason for issues arising in the quality of the courseware.

Given these constraints, the most pragmatic route for developers in Malaysia to take is to simply convert existing printed learning modules into a digital version. It has been well established in the global literature that such a practice affects the effectiveness of the courseware in use. It is therefore a significant problem in the software development system in Malaysia and can be identified as a factor that strongly contributes to the problems in the interface design, as well as more general issues with the courseware, which impact on its effectivity and uptake. It could perhaps be concluded from this that the courseware developers are more focused on profit considerations than producing an effective product with interface design that accommodates users' needs.

7.6 Conclusion

Primarily, the development process largely ignores the importance of user involvement and prototyping methods as recommended in the international literature. A number of reasons have been identified. Firstly, the ministry policy on design and the existing Malaysian guidelines provide no comprehensive explanation about, or requirement to conduct, user needs analyses and product testing. Secondly, the limited time and budgets allocated by the ministry were identified as a subtheme, and it was argued by the informants that these constraints require the courseware developers to concentrate solely on ministry requirements rather than contextually specific end-user needs, which are time consuming to acquire. And, importantly, relationships have not been established or encouraged among the main stakeholders (developers, the ministry and schools), so meaningful contact between them does not occur.

Out of these primary issues, a number of significant factors arise. Because sole authority for decision-making is held by the ministry, developers respond to the letter of the guidelines they are provided with, to the exclusion of other types of

research or analysis. And because there is limited pedagogical knowledge within the development team, a misunderstanding among the courseware developers about the concept of interactive learning arises, which may, in turn, lead to the reductive strategy of simply converting the printed learning modules to an electronic format. In addition, because of limited communication between the stakeholders, each functions within their tightly designated roles, so sharing and integration of specialist expertise does not occur. For example, courseware developers conduct their product testing within their own team in response to the ministry requirements, without involving the teachers and students. And a deficit of skills in the development teams leads to the outsourcing of major interface design components, which further fragments the design process and design roles.

These shortfalls in the design and development process of the interactive courseware largely align with the findings of studies in other contexts. As outlined in the literature, there are four main factors that influence the production of interface design. They are the user needs and requirement analysis, functionality, decision-making and creativity. This research study has revealed problems within the courseware development process that may influence all of these factors. Firstly, the current lack of user involvement delimits the user needs analysis and requirements. Secondly, a lack of awareness of interface design and pedagogical theory and strategies among the designers can be related to the effectivity of the interface design and the functionality of the courseware in general. Thirdly, the centralisation of dlayou in the ministry limits the capacity of developers and teachers to understand each other's needs. And finally, the limitation and requirement specificities in the guidelines limit creativity and the potential for innovation.

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Chapter 8
A Randomized Pilot Study to Determine the Effectiveness of Dynamic Visual-Based Assistive Technology in Cognitive Stimulation Toward Alzheimer Patients

Muhamad Fairus Kamaruzaman and Riaza Mohd Rias

Abstract A cognitive disability represents a substantial limitation in psychological task that decreases individual capability to perform desired activities. Assistive technology can lessen the effect of this disability and bestow a better quality of life especially for individuals with Alzheimer disease. In Malaysia, it is believed that 50,000 individuals suffer from this disease and that numbers keep increasing yearly. The state of the art has ascertained that psychosocial therapies are able to ease worsening of Alzheimer patients' condition. Reminiscence psychoanalysis can reduce depressed symptoms, sustain in-group involvement, and persuade acquaintances to appraise their achievement though modest interest has been given to realize the dynamic visual effect in cognitive stimulation in giving Alzheimer patient psychotherapy, which is the core field merit of this study. Hence, the objective of this study is to ascertain the effectiveness of dynamic visual-based assistive technology in cognitive stimulation for Alzheimer disease patients. A randomized pilot study has been conducted on 30 early impaired patients who have been alleged of having Alzheimer disease. The design form-based interactive dynamic visual has been tested, and observations were made particularly to classify its competence and efficiency. The dynamic visual model facilitated connection to motivate cognitive level learning capabilities and judgment particularly for patients with Alzheimer's.

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Keywords Dynamic visual • Alzheimer patients • Cognitive stimulation • Motivation

8.1 Introduction

Alzheimer disease (AD) is a disorder that seriously affects an individual's ability to perform daily activities. Individuals who were affected by AD remain physically able while slowly losing reminiscence and cognitive skill, which makes observation activities an essential aspect of care [1]. AD primarily involves the part of the brain that controls thought, reminiscence, and verbal communication. Reminiscences are significant as they form the life of the human being. The loss of reminiscence can affect revolutionize in personality and behavior [2, 3]. For individual with early stage of AD, mild forgetfulness and confusion can lead to medication inaccuracy, missed appointments, and nervousness. It is also believed that significant cognitive disabilities manifest, eventually requiring 24 h care and support.

Most individuals with Alzheimer's respond properly to a well-planned program, tailored to the individual needs of the person. A well-designed intervention approach will include some level of communication therapy, game design reminiscence therapy, dynamic visual psychoanalysis therapy, social skill development, and behavior adaptation, which has been delivered minimally by trained professionals in a consistent, inclusive, and harmonized approach [1, 4]. The ideal program is one which offers a 1:1 psychotherapist/instructor to caretaker ratio with a small group environment. A meet up with other caregivers of patients with a similar level of AD syndrome is very beneficial (family support groups). Caretakers must realize the value of their role not just as supporter but also as "co-therapists" in extending the training to the domicile environment.

The mainstreams of services in Malaysia have adopted models from developed countries. While quality of these models may be pertinent domestically, they are by and large not suitable to meet the vast needs of the AD patients. Figure 8.1 shows the provision of services by various service providers in the country [5]. Services for the AD patients are currently fragmented, hospital based, and scarce and do not appear to be a precedence in therapeutic development locally. Caretakers face many encumbrances from service providers. Services are better at assessment than rehabilitation. The chronic care for these AD patients fatigues support from providers and caretakers. There is a prevailing perception of depression. Most services do not adequately address the emotional burden of the family. Hence, there is a high "dropout" rate in the utilization of rehabilitative services by caregivers.

Assistive technology is making feasible much more sophisticated, adaptive technology for individuals with disabilities particularly AD patients. The

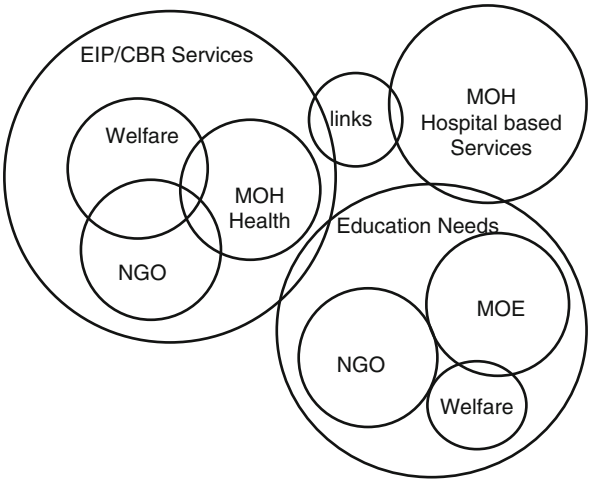

Fig. 8.1 Overview of current disability services in Malaysia

existence of numerous medium, mutually with sophisticated input and output devices, makes it much simpler to offer viable alternative reminiscence approach for people with AD. Hence, it bestows several culture psychotherapy environments allowing the AD patients to grasp the visualization information at their own velocity.

8.2 Background Study

AD is an ordinary structure of neurodegeneration that involves a progressive breakdown of cognitive function. Cognitive impairments commonly begin with noticeable difficulties in remembering recent activities [6] as well as spatial disorientation [7] and semantic memory impairments [8]. Literatures have demonstrated that psychosocial therapies are competent to ease worsening of patients' situation [9]. People who are suffering from AD lose the capability to keep new memories. This deficiency has directly impacted upon their ability to involve in a normal conversation. The use of assistive technology could help individuals reduce many of these limitations and achieve greater involvement in personal, social, and vocational activities. It is also believed that the assistive technology capacity to trail effectively user's progression of responsibilities and actions. It also could be used to supply support to elderly people with dementia and their caretakers [10, 11]. Most intervention technology is designed to sustain individuals' entire ordinary routine, such

as reminiscence assistance or designing tools [10]. It was found that reminiscence therapy is the most positive and successful incarnation, promotes shared positive human experience, and supports individuals with dementia and caregivers in an embryonic mutually supportive caring relationship [12, 13]. It is also believed that dynamic visual-based assistive technology and sensitivity functions, semantic reminiscence, and meditation correlated considerably with the degree of daily livelihood in patients with AD [14]. It was found that the dynamic visual which integrates video and animation medium will make the AD patients more engage to seek and gain the information as it improved knowledge retrieval during the therapy session.

8.3 Material and Methods

Data for this investigation is gathered through observation and interview of 30 AD patients aged 60 to 78 years who have been diagnosed with Alzheimer disorder; please refer to Appendix. The small group samples were taken from the Alzheimer Disease Foundation Malaysia (ADFM). These patients had been treated with normal reminiscent therapy in ADFM. None of the patients had previous experience with the dynamic visual-based assistive technology therapy. The dynamic visual is made up of graphic visual images, animations, and audiovisuals. Hence, this dynamic visual allows AD patients to carry out a variety of different stimulation programs, at different stages and at various times during the day. Generally, the dynamic visual application program consists of three separate tasks or motivation applications across the domain of cognitive attention, reminiscence, and point of reference [15]. All the AD patients were educated and edified before the investigation took place with the use of embedded device especially on the touch screen.

8.4 Findings

AD patients in the experimental group demonstrated numerous engagements and responses during the experimentation. All the AD patients experience the experimentation with the support of the ADFM staff, where a minority of them were not optimistically betrothed toward the embedded device. It is made to understand that they were equivocal, misrepresented, bewildered, and immature. From the entire

number of AD respondents, 16 of them were female, and the remaining 14 were male. It is believed that, from the psychoanalysis, the AD female patients were prominent in using the tools throughout the experimentation. They were inspired and engaged with the dynamic visual as a part of cultivating their reminiscence and cognition.

8.5 Discussion

The development of incorporating the vibrant visual and embedded technology is a segment of the enhancement method of developing the said model. Numerous enhancement methods have materialized over the past decade, but it only focuses on the identical concepts, which is to assist the special group of people. In order to design a decent model, a system development framework has been used in this research. It is believed that in the SDM linear framework, the cascade model has been used to impart the direction process such as assessing, forming, analyzing, and sustaining. The cascade model method will flow forward and never undo. Hence, it will enhance the system from time to time after mobilizing the response from other future AD patients [16].

8.6 Conclusion

The outcome of this analysis proposes that this is a promising avenue to facilitate maximizing a patient's cognitive role in the perspective of a progressive degenerative disorder, probably changing the cause of the stipulation on both the patients and the caregivers.

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Appendix: Data Analysis Collection on Dynamic Visual-Based Assistive Technology Therapy

Patient	Age	Sex	Dynamic visual reminiscence therapy									
			Capability to retrieve dynamic visual	Reminiscence phase						Assertive phase		
				Bad	Poor	Moderate	Good	Excellent	Patient reaction	Low	Medium	High
P1	63	Male	No				√		Blur	√		
P2	67	Male	No		√				Mystify	√		
P3	68	Male	No		√				Hushed	√		
P4	67	Female	Yes			√			Keen		√	
P5	69	Female	Yes				√		Determine			√
P6	71	Female	Yes				√		Connect			√
P7	73	Female	Yes			√			Enjoy		√	
P8	73	Female	Yes					√	Impatient			√
P9	78	Female	Yes	√					Inspire			√
P10	71	Female	Yes				√		Intense			√
P11	70	Male	No			√			Blur		√	
P12	69	Male	No		√				Mystify	√		
P13	68	Male	No		√				Hushed		√	
P14	67	Male	No					√	Keen		√	
P15	66	Female	No				√		Determine			√
P16	69	Female	No			√			Connect			√
P17	73	Female	Yes			√			Enjoy		√	
P18	63	Female	Yes					√	Impatient			√
P19	65	Female	Yes				√		Inspire			√

P20	71	Female	Yes					√		Intense		√
P21	63	Male	Yes		√					Blur	√	
P22	67	Male	Yes		√					Mystify	√	
P23	68	Male	Yes		√					Hushed	√	
P24	65	Male	Yes			√				Keen	√	
P25	69	Male	Yes				√			Determine	√	
P26	71	Male	Yes				√			Connect	√	
P27	66	Male	Yes		√					Enjoy	√	
P28	73	Female	Yes					√		Impatient	√	
P29	76	Female	No					√		Inspire		√
P30	73	Female	No				√			Intense	√	

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Chapter 9
Socioeconomic and Political Implications for Ethnic and National Sentiments: The Impact on Nation-Building Policy Efforts

Abdul Raufu Ambali, Ahmad Naqiyuddin Bakar, Jasmine Ahmad, Shaharuddin Badaruddin, Mazlan Che Soh, and Nor Ezrine Yussoff

Abstract The issue of ethnic attachment is always in conflict with national sentiment, which can affect nation-building efforts in any multiracial country of the world. This paper examines the issues in Malaysian context. The findings of the study show significant relationships between social (H1) and economic factors (H2) and national sentiment with beta coefficient $\beta = 0.111$ and 0.138, respectively. However, the relationship between political factor (H3) and national sentiment is extremely weak with $\beta = 0.008$. A bootstrapping procedure of 1,000 resampling method was followed. The results supported the hypotheses H1 and H2 with *t-values* of 1.63 and 1.88, $p < 0.01$, respectively, except for H3 with *t*-value of 0.09, $p > 0.05$. As such the main significant contributing effects to national sentiment in this study are both social and economic factors, where R2 is 5.4 %. Secondly, the three factors were also significantly related to ethnic sentiment with beta coefficients of $\beta = 0.275$, 0.196, and 0.148. Thus, using the bootstrapping procedure of 1,000 resampling again, the hypotheses (H4, H5, and H6) were supported with *t*-values of 3.39, 2.264, and 1.821, $p < 0.001$, respectively. In this context, the hypotheses support the theory that socioeconomic and political factors have significant effects on ethnic sentiment of people with R2 of 30.1 %. Finally, the results indicate that both national (H7) and

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ethnic sentiments (H8) have significant relations with nation-building policy efforts, where beta coefficients are $\beta = 0.141$ and 0.53 and t-values of 3.49 and 8.79, $p < 0.0001$, respectively.

Keywords Social relation • Socioeconomic • Political status • Ethnic group • National inclination • Nation-building • Policy efforts

9.1 Introduction

Despite the rising importance of nationalist sentiment, there has been relatively little research on the socioeconomic and political factors associated with national identity or ethnic attachments among multiracial countries such as Malaysia. This study attempts to fill the gap by exploring the factors of ethnic identity and national identification in Malaysia. While ethnic factionalism has a negative impact on economic development and political stability of a country, nation-building has been proposed as a mechanism for integration among races. Rethinking the nation-building concept is a policy that promotes attachment to nation over ethnic identities. It has been often proposed as a mechanism for integration and conflict reduction. The main objective of this study is to examine the influence of socioeconomic and political status of people on their attachments to both ethnic groups and the nation they belong to. In addition, it also examines the extent to which both ethnic and national sentiments can affect nation-building efforts of the country. Methodologically, this study qualitatively relies on nationalism theoretical framework and blends with survey questionnaire to have an in-depth understanding of the subject.

9.2 Literature Review

Theoretical Background of Nation-Building and National Sentiment

Nation-building is a fashionable term that has been used in different contexts among political scientists since the 1950s. Among the forefront proponents of the term include American academic community [1]. Nation-building was historically and primarily theorized to describe the notion of national integration and consolidation that aimed at establishing modern nation states as opposed to the traditional feudal, ethnic feelings and royal dynastic states. Nation-building in its broader sense when used by political scientists covers all socioeconomic and political strategies initiated by a leader to change the society for the better [2]. Thus, for political scientists, the concept of "nation-building" became what "industrialization" represents in social

economy. It is an indispensable tool for detecting and analyzing the sociopolitical and economical dynamics that have produced the modern state today. Therefore, nation-building is a process that can be understood as a state-led process of evoking national identity or sentiment to promote unity and social cohesion among its people. However, the state-led institutions and political systems alone cannot accomplish nation-building without emphasis on the roles of communities within the process [3].

Contributing Factors to Feelings of National and Ethnic Sentiments

Social Factor (SOCF)

One key important feeling toward national sentiment is the degree of social relation and cohesion among the diverse groups of people in a society. Hence, social cohesion can be viewed as a unique attribute of a society to establish relationships between various individuals, groups, associations, as well as territorial units [4]. This can be achieved when diverse group works toward the well-being of all the members, minimizing disparities and avoiding marginalization and entails networks of relationships. It therefore democratically means a mutually supportive society that ensures the welfare of its individual members by formulating and implementing policies that minimize disparities among people as well as avoid polarizations among ethnic groups. In this context, it was lamented that a society with a lack of good social relation will result in social disorder and low levels of social interaction between and within communities and of course low levels of national sentiment [4]. Thus, it produces a meaningful social action that engrosses positions for individuals according to their dispositions and knowledge in society [5].

Political Factor (POLF)

The lack of effective participation by the members of the ethnic groups at different levels of societal affairs is a key factor in forming ethnic cleavages and feelings of social exclusion from a state. The national sentiment and nation-building processes can be jeopardized when some ethnic groups are marginalized or not fully engaged in an active social participation. The feeling of ethnic marginalization among certain groups in a multiracial society can be conceived as an ethnic inequality for political opportunity, which could create a vicious problem such as political mobilization of ethnic group, social unrest, and uprising that can lead to an atrophy of civics and indifference [5]. Thus, there is a common notion among various authors that political factor works on the principle of providing avenues for individual members of society to equally participate in economic, sociopolitical, and cultural life in an effective manner [5]. Thus, it can be considered as an expression of the

equal distribution of various rights to all members of society regardless of their ethnic groups. It is arguable that politics of inclusion should recognize differences with respect to ethnicity, gender, and age and then transform these differences into not only stable but flexible coalitions operating on different levels of state governance apparatus in the country.

Economic Factor (ECOF)

It is considered to be a ground issue that could make people in the society feel the sense of belonging to a nation or parochial ethnic groups. From a social capital perspective, the economic status of individuals can contribute to national inclination and feeling of belonging to a particular ethnic group (i.e., ethnic sentiment coined as ESENT) depending on where his or her economic means of living is established the most. It works and sustains on the principle of socioeconomic norms and structure to achieve effective mutual communication or cooperation among social agents. In this context, a famous American sociologist, Coleman [6] has earlier linked economic factor of national sentiment to social structure in terms of goals that could not be possible for individuals or groups to achieve without it. Hence, economic factor embraces social structure that makes actions of individual members of a society work within the structure or class. Jochum [7] has demonstrated two principal dimensions of economic factor with regard to the structural aspect of communal relations. While the first perspective focuses on direct interconnections that individual social actor maintains with other actors, the second perspective is devoted for an individual's relative position within the given economic network in society. Both of them can significantly reinforce the networks among people through the shared resources.

Policy of National Sentiment and Nation-Building

Social integration theorists have argued that the establishment of national sentiment (NASENT) and/or nation-building (NAB) is grounded in the notion of collective identity policy agenda. Collective identity refers to a situation where each active member of society defines himself or herself to be affiliated to a social sphere rather than a specific ethnic background. Achieving a collective identity among different ethnic groups in a multiracial country is only possible when the government adopts policies that focus on national inclusion as opposed to exclusion and recognition as opposed to a sense of rejection. According to Habermas [8], this is where the government redirects public policies to focus on collective loyalties and use them to replace all forms of ethnic identification. This is where each individual member of a community, locality, and state feels a sense of belonging to a nation as a whole rather than an ethnic-centric sentiment. Instead of nation-building, nation failures do occur where

normal politics and redistribution of socioeconomic means of life disappear [8]. Based on the above theoretical discussions from the literatures, three fundamental research questions are raised: first, is there a relationship between socioeconomic, political factors, and national sentiment? Second, is there a relationship between socioeconomic, political factors, and ethnic sentiment? Third, is there a relationship between ethnonational sentiments and nation-building policy efforts? To answer the three questions, eight related hypotheses are postulated in this study, which are: H1, social factor (SCOF) is positively related to national sentiment (NASENT); H2, economic factor (ECOF) is positively related to national sentiment (NASENT); H3, political factor (ECOF) is positively related to national sentiment (NASENT); H4, social factor (SCOF) is positively related to ethnic sentiment (ESENT); H5, economic factor (ECOF) is positively related to ethnic sentiment (ESENT); H6, political factor (ECOF) is positively related to ethnic sentiment (ESENT); H7, national sentiment is positively related to nation-building policy efforts; and H8, ethnic sentiment is positively related to nation-building policy efforts.

9.3 Methodology of the Study

Sampling Technique, Sample Size, and Data Collection

In this study, a random sampling was used to obtain information from Klang Valley areas in Malaysia. The valid sample size for this study was 496 out of 500 collected. Hence, the unit of analysis is individual citizens at different locations of the areas. Data was collected through personally administered questionnaires by the team of researchers between May and June 2013. Therefore, the research is a cross-sectional survey carried out using non-covariance-based structural equation model for data analysis.

Goodness of Measures for Instrumentation

Construct validity was assessed by looking at loadings and cross loadings to identify problematic items, if any. Following Hair et al. [9], a significant value of 0.5 loadings was used as a cutoff. As has been depicted in Table 9.1, items measuring each construct in the study are highly loaded on their particular construct and loaded lower on others; thus, construct validity of the instruments is established. The results of Table 9.1 show that all items' loadings exceeded the recommended value of 0.5 suggested by Hair et al. [9]. In addition, the composite reliability is used to test how far the construct indicators really represent the latent variables and the values obtained ranging from 0.911 to 0.946, which exceeded the recommended value of 0.7 by Hair et al. [9] as shown in Table 9.1. The average variance extracted (AVE)

Table 9.1 Measurement model, composite reliability, and average variance extracted

Items	Loads	Composite reliability	Average variance extracted
E14<–ECOF	0.769	0.931	0.601
E15<–ECOF	0.787		
E16<–ECOF	0.818		
E17<–ECOF	0.773		
E18<–ECOF	0.761		
E19<–ECOF	0.792		
E20<–ECOF	0.767		
E21<–ECOF	0.764		
C16<–ESENT	0.852	0.916	0.609
C17<–ESENT	0.831		
C18<–ESENT	0.801		
C19<–ESENT	0.738		
C20<–ESENT	0.759		
C21<–ESENT	0.768		
C22<–ESENT	0.705		
D1<–NAB	0.830	0.946	0.592
D10<–NAB	0.858		
D11<–NAB	0.822		
D12<–NAB	0.801		
D2<–NAB	0.749		
D3<–NAB	0.756		
D4<–NAB	0.700		
D5<–NAB	0.687		
D6<–NAB	0.729		
D7<–NAB	0.781		
D8<–NAB	0.765		
B1<–NASENT	0.895	0.919	0.654
B2<–NASENT	0.889		
B3<–NASENT	0.759		
B6<–NASENT	0.756		
B7<–NASENT	0.775		
B8<–NASENT	0.766		
E5<–POLF	0.705	0.911	0.562
E6<–POLF	0.758		
E7<–POLF	0.774		
E8<–POLF	0.808		
E9<–POLF	0.755		
E1<–SOCF	0.773	0.861	0.674
E3<–SOCF	0.859		
E4<–SOCF	0.827		

Table 9.2 Discriminant validity of construct

Item	ECOF	ESEN	NAB	NASE	POLF	SOCF
ECOF	0.77					
ESEN	0.22	0.78				
NAB	0.30	0.31	0.76			
NASE	0.04	0.03	0.05	0.81		
POLF	0.54	0.23	0.38	0.03	0.75	
SOCF	0.38	0.24	0.50	0.04	0.46	0.82

was used to relatively examine the variance captured by the construct indicators to measurement error. According to Barclay et al [10], the value must not be less than 0.5 for justification. In this study, the AVEs for the indicators are within the range of 0.562 and 0.674, respectively, to indicate adequate variance extracted [10].

The discriminant validity of the measures has equally been tested to examine the degree to which items differentiate among constructs through correlations between the measures for possible potential overlapping of constructs. Also whether the average variance shared between each construct and that of its measures is greater than the average variance shared between other constructs was explored. The results of Table 9.2 show that the squared correlations for each construct are less than the average square root of the variance extracted by the indicators measuring a particular construct. Hence, the measurement model reflects an adequate convergent validity and discriminant validity.

One of the most widely used tests is Cronbach's alpha employed in this study. The Cronbach's alpha results range from 0.76 to 0.94, thus confirming the reliability of the instrument. Given the self-reported nature of the data, we also assessed Harman one-factor test to examine any potential common method variance bias [11]. Common variance bias is problematic if a single latent factor accounts for the majority of the total explained variance. In this study, the result of the unrotated factor analysis shows that the first factor only accounted for 17.7 % of the total 64.2 % variance and thus common method bias does not arise [10].

9.4 Findings from the Study

Profile of Respondents and Descriptive Analysis of Variables

First, the frequency of distribution for profile of the respondents was conducted. The distribution of the respondents by gender is 70.6 % of male and 29.4 % of female. Majority of respondents are in the group of 31–40 years old which is about 41.6 % followed by 41–50 years old, 34.3 % respectively. As this study only focused on the Klang Valley areas, most respondents are from Area/KL, District/PJ, District/Klang, District/Gombak, and District/Hulu Langat. Participants comprised of Malay (64.1 %), Indian (16.5), Chinese (19 %), and others (0.4 %). Most of the

respondents' income levels ranged from RM3001 to 4000 (46.4) followed by RM2001 to 3000 (34.5 %). Most of the respondents have economic dependants between 3 and 5 (43.3 %). Finally, most of the respondents possessed secondary education (86.3 %). Second, out of a 5-point Likert scale, the perceived mean levels of socioeconomic and political factors (SOCF, ECOF, and POLF) are considered very high among the respondents with mean statistical values of M = 4.5, 4.32, and 4.38 respectively. Also, the levels of respondents' attachments toward ethnic groups (ESENT), national sentiment (NASENT), and nation-building (NAB) efforts are very high with mean values of M = 4.57, 4.54, and 4.51, respectively.

Hypothesis Testing

The researchers addressed the path coefficients among the predictors and predicted variables to ascertain the hypotheses put forward in the study. First, the results in Table 9.3 show significant relationships between social (H1) and economic factors (H2) and national sentiment with beta coefficient β = 0.111 and 0.138, respectively. However, the relationship between political factor (H3) and national sentiment is extremely weak with β = 0.008. To test the significant values of the beta coefficients, a bootstrapping procedure of 1,000 resampling method was followed.

The results supported the hypotheses H1 and H2 with *t*-values of 1.63 and 1.88, $p < 0.01$, respectively, except for H3 with *t*-value of 0.09, $p > 0.05$. As such the main significant contributing effects to national sentiment in this study are both social and economic factors, where R2 is 5.4 %. Secondly, the three factors were also significantly related to ethnic sentiment with beta coefficients of β = 0.275, 0.196, and 0.148. The hypotheses (H4, H5, and H6) were supported with *t*-values of 3.39, 2.264, and 1.821, $p < 0.001$, respectively. In this context, the hypotheses support the theory that socioeconomic and political factors have significant effects on ethnic sentiment of people with R2 of 30.1 %. Finally, the results indicate that both national (H7) and ethnic sentiments (H8) have significant

Table 9.3 Summary of OLS analysis results

Hyp	Relationship	*β*-coeff	*t*-value	Remark
H1	SOCF > NASENT	0.111	1.63*	Accept
H2	ECOF > NASENT	0.138	1.88*	Accept
H3	POLF- > NASENT	0.008	0.09	Reject
H4	SOCF- > ESENT	0.275	3.39**	Accept
H5	ECOF- > ESENT	0.196	2.26**	Accept
H6	POLF- > ESENT	0.146	1.82*	Accept
H7	NASENT- > NAB	0.141	3.49***	Accept
H8	ESENT- > NAB	0.530	8.79***	Accept

Note: *P<0.85
***P<0.01
***P<0.001

relationships with nation-building policy efforts, where beta coefficients are $\beta = 0.141$ and 0.53 and t-values of 3.49 and 8.79, $p < 0.0001$ respectively.

9.5 Discussion

The results obtained from the study have shown the importance of socioeconomic and political factors and the influence on both national sentiments of the people and their attachment to their specific ethnic groups. The implications from the results can be envisaged in twofolds. First, individual attachment and his or her identification as a Malaysian will depend on the degree of sense of inclusion in society both socially and economically. If a person has no sense of belonging or feeling of being left alone or lack of social cohesion among other races in society, the tendency of ethnic inclination will be very high. Second, individual that is given the opportunity to participate at different levels of societal affairs is likely to attach himself or herself to a nation rather than a certain ethnic group. However, if such opportunities are denied, the tendency toward ethnic cleavage would be very high. The implication is that governments of the multiracial nations such as Malaysia should always embark on economic policies for inclusion and continue on its national policies for equal and active participations of its diverse ethnic groups with special reference to shared natural resources and social capitals at large.

In addition, the findings (with strong t-values of 3.49 and 8.79, respectively) have indicated that both national sentiment and ethnic attachment can affect nation-building efforts of the government. In other words, efforts of the government toward nation-building in any given society can only be successfully achieved when majority of the people show their sense of belonging to the same nation rather than belonging to a certain ethnic group. Sense of belonging to a particular ethnic group instead of a nation is a severe damage to effort toward nation-building. The setback of a nation begins where individual members of the society place his or her ethnic value above the national value. In this context, the struggle for ethnic group dominant is highly envisaged above the national one and thus jeopardizes the national achievements.

9.6 Recommendation

There is a need for strengthening the spirit of unity in diversity among races to abolish polarization. Policy efforts on unity should not be based on geographical factor or racial groups but directed to national sentiment as one nation. More efforts are needed to build trust and confidence between the government and racial groups. More policy programs that reflect sense of inclusion to be part of socioeconomic and political activities must be embarked upon by the government.

9.7 Conclusion

This paper has tested the theory underlying the issues of socioeconomic and political factors that can affect both ethnic and national sentiments. It is noted that while the ethnic factionalism and diversity have a negative impact on economic development and political stability of a country, nation-building policy efforts must be strengthened as a mechanism for integration among races. It is argued that in a country with high ethnic diversity, minority has weaker national sentiment and feeling than majority, and this can jeopardize the national security and economic growth of the country. Rethinking the nation-building concept is a policy process that promotes attachment to nation over ethnic and regional identities. More policy efforts must be undertaken to unite and integrate people together for common identification as Malaysians.

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Chapter 10
The Effectiveness of Visual Rhetoric in Public Awareness Prints Advertising as a Social Culture Space in Malaysia

Nur Safinas Albakry and Ghazali Daimin

Abstract The purpose of this paper is to explore the role being played by visual rhetoric in Malaysia's public announcement print advertising scene. In particular, this study will discuss how visual rhetoric represents image with underlying meanings in print media such as magazines and newspaper advertisements by using semiotic approaches. Visual rhetoric seems to be an important element to increase the effectiveness of the process of information exchange. It yields more successful communication process with audiences. In fact visual rhetoric helps to get messages from audiences in a persuasive way. It aids audiences to assign meaning to what they sense and believe. The output from this study will be used to propose a system or guideline that would be employed by visual rhetoric in print media to instil advertising awareness. This allows people from various social cultures to engage themselves with the activity of comprehending the message carried by the visuals displayed to them. In other words, visual rhetoric can be described as a tool for media communication. This study will also spread knowledge on the usefulness of visual rhetoric in print advertising beyond the fact that they are a pleasure to the eyes as their presence accounts as beautiful crafts to the eyes of human. Audiences processing the message of an advertisement can be awed by what they see, thus increasing their brand awareness. In short, the persuasion through semiotic imagery language factor has been attained.

Keywords Visual rhetoric • Public awareness • Print advertising • Social culture space

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10.1 Introduction

Today people live in a visually intensive society and world of spectacular and exciting images. Visual literacy has its own system of language that allows people to socially construct its meaning process. They are bombarded continuously with streams of visual simulation from all manners of different media approaches in everyday life. They see mediated images more often than words. Visual image may control the global cultural, technological empirical of mass media as a central medium of information may play the importance of scholar of visual communication across the world. The use of rhetorical in creative industries especially in advertising as a tool to persuade audience and also to help them perceive image quickly. According to [1], visual rhetoric is an artful deviation, relative to audience expectation, which leads the audience to have a more effective and favourable brand attitude towards the ads. In advertising the image is a perfect 're-presentation' of life. Hence, an analysis of visual rhetoric considers how images work alone and collaborate with other elements to create an argument designed for audience to choose to present information or argument through image. According to [2], 'in advertising the signification of the image is undoubtedly intentional, which signifies that the advertising message is formed a priority of certain attributes of products which signifies to have been transmitted as clearly as possible. Throughout this study, the effective visual rhetoric will be analyzed on all the images in print media which include newspaper and magazines. It will also show that visual rhetoric is effective in advertisements carrying different types of semiotic meaning through different levels of response from viewers in persuasive brand recalled towards the ads. The purpose of this study is to propose a guideline for the effective use of visual content in general advertising in Malaysia. This knowledge base will be seen as necessary in educational environments to support collaborative learning especially for educators and students, which is needed to bridge cultural gaps in our social environment. This study also will develop new typology a unique contribution first by focusing on rhetorical figures constructed from visual rather than verbal elements which may affect consumers processing and response.

Problem of Statement

The current problem in advertising visual creative value is because of the lack of creative standard in advertising which has all along been plugging. As a result Malaysian ads have not won any winning work at international competitions such as the Cannes International Advertising Festival 2010. Accordingly, [3] claims that visual contents in ads are lacking in visual rhetoric compared to Indonesia which won the first gold in Cannes International Advertising Festival 2010. The impact of content regulation by Advertising Standards Authority Malaysia [4] has given an

effect towards creative visual impact through imagery in advertisements. Given this, the advertising practitioners are faced with the challenges of balancing their advertising objective which needs to comply with and stave off further regulations. In conjunction with these impacts, the Malaysian creative industry is also lacking in passion and creative talent. According to the Chairman of Kancil Award 2012, David D. Mitchell [5, 6], the country is losing potential talents who have the passion and creativity and drive to excel within the industry. It is getting more difficult for young talents that are willing to stay long in the industry due to lower starting salary. Young talents have realized that the level of thinking of design is very low and their knowledge in constructing ideas seems lost. They also need to understand that design is not only about creating layout for print or online, the space and colour but also about the principles, the purpose, the rationale and most importantly how the whole design process and outcome can contribute to the society and country [7]. Furthermore, the creative content in Malaysia should learn from other global countries with regard to how countries like Japan, Singapore, Indonesia, the Philippines and China are turning to creative industries to reinvent its economics. Injection of strong visual identity, visual culture and visual language in built are strong visual rhetoric in communication message in advertisement. Creative advertising is believed to have significant impact in influencing and shaping the national identity and culture of a nation, especially through the image and message portrayed in advertisements [8].

10.2 Significance of the Study

Academic and Researcher

Developing the framework of visual approach in advertising design element responses to identify patterns of meaning construction. As part of this study, the academician will use visual rhetoric as cultural element studies as an important role in persuasive advertisements where visual rhetoric and semiotics will act as a measurement tool to gauge the culture element evidents.

Advertising Practitioners

The theoretical guideline will help practitioners and give them the power of visual imagery to persuade people to build a relationship with a brand awareness and liking for audience processing of advertisement message. Advertiser will use the visual imagery to enhance or strengthen messages about their products or services.

Consumers

By applying effective visual rhetoric works in advertisements, it will regain the greater influence in views attitudinal responses, which will help to generate even more favourable reaction towards the product or service in advertising. Studies have stated that visual communication has the greatest impact on choice and buying decision of consumers.

Graphic Design Students

This study also will involve students who study advertising design course which will help them to apply conceptual thinking, methodologies and processes in the creation of an effective advertising campaign as a part of design principles. As they create varied visual messages, students will consider what makes an image iconic, how visual and verbal elements contribute to meaning and what role images play in news stories of persuasive advertisement.

10.3 Literature Review

Visual Rhetoric

Visual rhetoric is used to draw the reader's attention and persuade them towards the message recalled. Visual rhetoric can be described as a form of communication that uses images for creating meaning or constructing an argument. Hence, an analysis of visual rhetoric considers how images work alone and collaborate with other elements to create an argument designed for audience choice to present information or argument through image. Visual rhetoric has been used to mean anything from the use of images as argument, to the arrangement of elements on a page for rhetorical effect, to the use of typography (fonts) and analysis of existing image and visuals. Visual rhetoric is a term used to describe the study of visual imagery within the rhetorical framework discipline. According to [9], to qualify an image as visual rhetoric terms, he defined that the visual imagery must be able to serve as a sign, be symbolic and involve human intervention and the message must be communicated to the audience. Furthermore, throughout the rhetoric elements, it may influence the people's way of thinking and belief by using strategic symbol systems. The application of rhetorical perspective on visual imagery is to investigate the features of visual elements on generating the theory of rhetoric by taking into account the distinct characteristic of visual symbols. Rhetoric perspective that was used in the inductive approach was focused on the qualities and functions of images and how visual symbols were operated. Visual rhetoric must persuade the audience through

the message either verbal or visual communication which it does to discover the communicative dimensions of images through attention to their nature and the function or to evaluate the subjects. A scholar by [1, 10] stated that visual rhetoric is related to the framing of message and method of effective persuasion. A detail definition of visual rhetoric may be defined as theoretical and practical investigation of the effects of image-based signifying systems on human subjects in a particular situation. The interpretation of visual message may involve the processes of talking, listening, reading and writing about seeing with the above considerations in mind.

Visual rhetoric involves how the audience choose to present information or argument through image. Therefore, they used visual rhetoric figures as a way of expression to aestheticize the visuality, and in this way they increase the effectiveness of the process of meaning exchange and reinforce their communication process [11]. To support the ideas of visual rhetoric is just not about the superior design and aesthetic but also how cultures represent and meanings are reflected, communicated and altered by visual imagery. The exploration of visual rhetoric is a powerful role that visuality plays in shaping the public's symbolic actions which involve range of social life: how we perform; how we see (both literacy or metaphorically); how we remember, memorialize and confront the issues it shows; and how the visual is foundational to communication.

Visual Rhetoric and Advertising Persuasive

In advertising the image is a perfect 're-presentation' of life. Hence, an analysis of visual rhetoric considers how images work alone and collaborate with other elements to create an argument designed for audience to choose to present information or argument through image. Therefore, advertisers use visual rhetoric figures as a way of expression to aestheticize the visuality, and in this way they increase the effectiveness of the process of meaning exchange and reinforce their communication process [11]. In other words, initial attention is more likely to turn to interest with strong visual. The research of visual literacy in advertising concluded that ads with visual imagery will tend to pull more readers into the body copy. In other words, attention of advertisements is more likely to turn to interest with strong visual image. Besides, the advertisers start to add additional value to themselves and they mask their unique selling message. A rhetorical figure is an artful deviation, in the form that adheres to an identifiable template [1, 10]. The use of art deviations was added as an interest to advertisements. Besides, typology of visual rhetoric figures in advertising was given a positive impact on consumer response as well as verbal rhetorical figures. Additionally, the consumers are expected to respond to the visual image that artfully deviates from expectations. The pleasures arise with the successfully elaboration of picture by supporting with verbal rhetorical and direct processing to solve the puzzle it presents [1].

In advertising functions, it may be viewed as the construction of semiotic language for the works of rhetoric in grabbing consumers to buy the products or services that

are being advertised. As Scott mentioned that advertising image as a form of rhetorical elements, the visual must have certain capabilities and characteristic. The visual elements must be capable of representing concept, abstraction, actions, metaphor and modifiers such that they can be used in the invention of complex argument. Visual elements must also carry meaningful variation in their manner of delivery, such that the selection of style can suggest an intended evaluation. As a result, the advertising image should accommodate with the easily read visual message and act to consumers' response [12].

Refer to [13] had highlighted that visual rhetoric given in theoretical about the power visual image in persuasive method is a part of the communication message. Advertising in all forms had used visual arguments through juxtaposition of image as means of persuasion. In this research, visual rhetoric is directly related to the main purpose of visual persuasion which is to make the audiences or viewers take action on the basis of emotional identification with what was depicted. In addition, by adapting the aspect of emotional element of visual imagery in advertisement, the advertiser was efficiently or guaranteed and eliciting the emotion impact which words literally and physically cannot possibly be replicated. Visual image may influence people's belief of photographic truth which can be shaped by changing the circumstances. A visual image produced by advertising concluded that the effectiveness of rhetorical devices in advertising communication may be considered with either semantic or syntactic properties.

10.4 Research Question

A. *What is the effect of visual rhetoric on image recall of persuasive responses towards the brand image?*
B. *What are the effects of using visual rhetoric on transformational approach in public service announcement (PSA) advertisements?*
C. *What is the effect of social culture in visual rhetoric in ads persuasion of public service announcement?*

10.5 Research Methodology

The chosen methods for data collection data:

(A) *Stage 1: Research Approach*

- Qualitative
  The major research approach in this study will be a qualitative data. The strength of qualitative research is its ability to provide complex textual description on how people experience and handle the given issues specifically

on visual advertising area. The qualitative methods are also most effective and appropriate for this study in indentifying intangible factors of social cultural context and contemporary phenomena in Malaysia towards print ads of public awareness. Ideally the use of qualitative method in this study method of choice will involve archival data, visual research, observations (non-participant and participant observation) and survey interview in order get the data from sampling population [14].

- Quantitative
  To support the qualitative method, the researcher will also use the quantitative method alongside this study. In the early stage of preliminary investigation of research question or testing of pilot study, quantitative method was used in order to help interpret or explain the quantitative findings. In this study, primary data was collected through distribution of questionnaires. Primary data collection method included survey questionnaires. A questionnaire can be fact or opinion based and may be answered by choosing from a list of options or writing out responses by hand. The goal of the questionnaires in this research is to demonstrate the understanding of visual rhetoric how the piece communicates its messages and meanings of print advertisements in Malaysia. Basically, the aspect of questions will be knowledge, understanding visual elements (iconic, symbolic and indexical) aesthetic values, culture based and content and interpretation of message. In this research, the questionnaires were based from Purdue University (2013). These resources cover how to study visual rhetorical element of analysis questions with a focus on demonstrating the respondents' understanding of the rhetorical situation and design principles. The questions will base on *informational, inspirational, motivational* and *functional* elements of this study.

(B) *Stage II: Content Analysis*
Findings of each category inside dimensions are systematically counted. The validated findings are analyzed towards the opinion of interviewees and survey questionnaires.

(C) *Stage III: Recommendations or Propose Framework*
From the validated findings, this study will propose the essential elements framework for successful visual rhetoric of visual advertising in Malaysia.

(D) *Sample*
The sample for this research will be the academicians, creative directors from advertising agencies and graphic designer. These were core persons that were responsible to present information in a way that were both accessible and memorable. The second phase of sample of this research will involve the policymaker from advertising agencies who will be responsible for ensuring that the advertising system functions efficiently in the interest of the public in this country (Majlis Rekabentuk Malaysia, Association Of Accredited Advertising Agents of Malaysia, Advertising Standards Authority Malaysia).

10.6 Conclusion

According to the previous studies and literature review, it can be concluded that visual rhetoric aspects should be considered as a measurement tool to gauge the culture element evident. A part of visual rhetoric is to provide a more uniform of message content since audience can 'read' the pictures' expression. Visual rhetoric creates the ability of communication knowledge role that visuality plays in shaping our public symbolic actions in interpreting image depicting independent and interdependent social culture interaction in print ads. This study aims also to ensure that the powerful of visual rhetoric in advertisements will help to bridge the cultural gaps in our social environment through visual semiotics language. This study will also extend knowledge of the usefulness of rhetorical in print advertising beyond the view that enjoyment of execution is solely responsible for audience processing the message of an advertisement, thereby increasing brand awareness and persuasion through semiotic imagery language. The important use of visual rhetoric and semiotic language helps in building powerful brand positioning in global industries with injection of strong visual identity, visual culture and visual language in communicating message of persuasive advertisement.

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Chapter 11
A Recognizable Symbol of the Wedding Ring as a Communication Object to Portray Marital Status

Nur Balqis Hakim Lokman Hakim and Hema Zulaika Hashim

Abstract The term 'wedding ring' is commonly used to describe the rings given by either or both the bride and groom during marital ceremony. The significance of wedding rings may differ in accordance to the people's culture, history, and religion. Particularly among the Malays, there is no specific design or characteristic of a ring to portray their marital status. Unlike the westerners, wedding bands are most commonly used as wedding rings, which have a diagnostic characteristic, a matching pair for both bride and groom and systematically used on the left ring finger indicating its significance to portray one's marital status. From this observation, we can see that wedding rings have been successfully recognized as a communication object to portray one's marital status within the western society. However, it is not exclusive only to the western people. The idea of wedding rings is common among Christians of different races. In Malaysia, we can see there is an arising acceptance of the idea of wedding rings as a communication object to portray one's marital status. This happens through the assimilations of wedding cultures among the multireligious/racial society in Malaysia. The openness of the Malays towards assimilation however is limited by the socially acceptable margin of good and bad. This research aims to discover the effectiveness of wedding rings as a communication object to portray marital status in the Malay society. The result will contribute in determining the designs of wedding rings that will be in demand in the Malaysian jewellery market and thus will enhance our local market by reaching to the target market. The method of research will be a descriptive research, and what to observe is the current Malay wedding culture and also the effectiveness of wedding rings as a communication object to portray one's marital status. For this, the researcher will conduct a survey to gather information from the samples of target population.

Keywords Symbol • Wedding rings • Communication object • Marital status

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11.1 Introduction

Design as concept – The design in this context refers to the pattern or the physical look of a product, specifically a metal product. Scoping down to jewellery, there are a lot of common designs, differed by culture and trends. For example, the norm of wedding rings for the Malays traditionally is usually yellow gold pattern-forged rings with floral or geometric motifs (Fig. 11.1). But for the Chinese, they would prefer white gold or yellow gold of plain band (Fig. 11.2) design. In Malaysia, there are several classes of jewelleries which are related to marriage culture and are different in each racial society: Malay, Chinese, Indians, etc. It is also influenced by the integration of different religions: Islam, Christianity, Hinduism, Buddhism, etc. This is because a marriage ceremony is a significant event not only in the cultural values but also dominantly guided by the preaching of one's religion. For example, for the Christians, both the bride and groom will exchange rings in the church after their oath. For the Indians, they require a piece of necklace for the bride as a symbol of marriage, traditionally.

The development in jewellery industry paved the way for the more contemporary design, thus giving wide choices for consumers to be creative with jewellery wearing, specifically for wedding ceremonies which are strongly influenced by culture and religion. The design of wedding rings used by a certain society will reflect the concept of the rings. Circular bands of gold or silver have no inherent meaning; they offer no concrete reflection or detail [1]. Rather, they are highly abstract and neutral in character, making it possible for the bond between referent and symbol to retain its power in the face of shifts and alterations [1].

In Malaysia, wedding rings are available in various designs ranging from the traditional to contemporary inspired. The current market seems to be highly aspired in feeding the target of multiracial society. In the western culture, the idea of wedding rings is not just mere wedding gifts. They are a sign of one's marital status. In the Malay culture, it is more common as a gift rather than a sign of one's marital

Fig. 11.1 Yellow gold pattern-forged ring [6]

Fig. 11.2 Yellow gold plain band ring [7]

status. An adorned ring finger on the left hand does not necessarily mean married, and the concept of wedding bands as to portray one's marital status does not exist in the Malay culture. However, being in a multiracial country, the Malays are exposed to many cultures, and thus, the culture of wedding ring exchange ceremony might have been assimilated with other cultures over the years, resulting in a significant change of concept in wedding ceremony. This research particularly focuses on the change of concept in the use of wedding rings and whether it is a recognizable communication object to portray one's marital status.

Creative Design

The design of wedding rings in the Malaysian market is a current concern because the trend will change when the new generation changes. This is closely related to the development of culture. Wedding rings are an object of culture, and thus the changes in its design will set a new direction. This is going to continue in the future, and this study will hypothetically determine the direction of how wedding ring designs will be. The process of designing a ring basically begins with the choices of material. Though gold is the common material for most wedding culture, but it is not suitable for the Malay society specifically for the groom (gold ring for the bride is acceptable) considering the rule of Islam which forbids men to wear gold. As we can see, even at the first step of the designing process, it is strongly influenced by the society's cultural and religious background. The process then develops to designing the physical pattern of the ring. Plain gold band is already an established wedding ring design in the western society, thus making it a recognizable symbol of one's marital status. To design for the Malays, generally it depends on the individual to go with traditional pattern-forged design, or a depiction of the famous Malay motif bunga tanjung, or rather go abroad to a contemporary style. There are no general rules when it comes to wedding ring designs for the Malays. The couple is free to choose in accordance to their affordability and liking (Fig. 11.3).

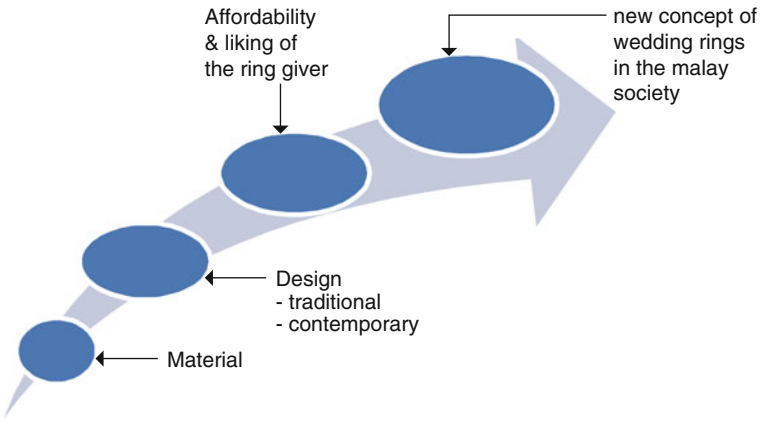

Fig. 11.3 The process of ring design

11.2 The System of Using Wedding Rings

The custom of ring giving may have evolved from the practice of down payment on the marriage agreement by the groom which may be in terms of land, livestock, or other valuables to the bride's family [2]. This is very similar with how the ring ceremony began in the Malay culture as well. There are three stages in the evolution of the human marital status as written by the institutional writes: (1) wife capture, (2) purchase, and (3) mutual assent [3]. The family of the suitor will send to the family of the chosen one a ring of gold, silver, or copper according to its circumstances, an unmistakable sign that the family begs the hand of the woman. This is a method of purchase marriage epoch, and then the father of the bride will decide the compensation and the condition of the wedding as the essential preliminaries of the purchase marriage [4].

From this we can see the apparent system in the process of marriage. The ring is one of the important elements in the process. As stated above, the rings of different materials were still perceived as an unmistakable sign of asking for the hand of the woman in marriage, because it was used in accordance with its circumstances. Thus, we can say that the material or design may play an important role as a recognizable element of the wedding rings to act as a communication object, but rather, the circumstances in which the ring is used play a bigger part as a recognizable element. The circumstances in the Muslim Malay marriage culture consist of three parts.

Commonly, the three main circumstances of using rings in the context of wedding ceremony (Fig. 11.4) are 'merisik', engagement, and 'akad'. 'Merisik' is an initiation step of the groom's family to ask for a girl's hand. The usual ring for this event is a pattern-forged ('belah rotan') gold ring. Whilst for the engagement, there's no exact law or trend for the ring designs. It depends on how much the groom-to-be would want to spend on it. Both of these two rings are only given to the bride and no exchange required.

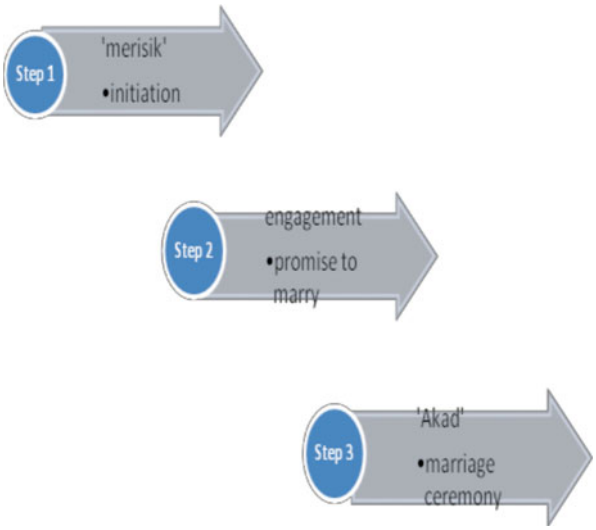

Fig. 11.4 Processes of wedding ceremony

The final one is the main wedding ring which is for the 'akad'. An 'akad' is the ceremony of marriage itself, handing over the bride as a wife to be the groom's responsibility. Some couples choose to exchange rings, but of no specific matching band design. The ring given to the bride is actually as a gift. Some don't even give rings but a bracelet or a necklace. But in the current trend, the matching set wedding ring designs have set its place in the Malaysian market and seem to get positive responds.

Wedding Rings to Denote Marital Status

In the United States, engagement and wedding rings are used to denote status, with the engagement ring seen as a promise of marriage (Fig. 11.5) and a wedding ring worn to indicate a formal (and usually legal) alliance with another person [3] (Fig. 11.6). This is a famous western culture that has been adapted in most western society.

Based on this finding, we can see that wedding rings are not just a mere gift from the groom to the bride and vice versa, it is a symbol of eternity and commitment. The symbolism is understood by the common perception of the society when if a woman wears a (usually solitaire) ring on her left hand ring finger, then it's an engagement ring, and if a gold band is worn, then it means she's married. This is a culture which began in the western society, but a tradition of great value for any other societies to adapt to. Some women prefer to wear both engagement and wedding rings together (Fig. 11.7). This proves the existing system of using rings in marriage ceremony.

Fig. 11.5 Solitaire ring [8]

Fig. 11.6 Wedding bands [9]

Wedding Rings as Communication Object

Object communication extends beyond clothing to other bodily adornments like the wedding rings or bind to indicate marital status [5]. In this paper, object communications are defined as objects that were worn or used by communicators and served as something that were able to tell receivers about that particular person. Attire is said to be the most common form of communication object as an assessment of people's personality traits.

Fig. 11.7 Engagement ring and wedding ring worn together [10]

Having three stages discussed earlier, 'merisik', engagement, and 'akad', the significance of a ring is dispersed into these three purposes. Because of the two rings prior to the 'akad', some couples choose to get a bracelet or a necklace instead for that main ceremony. In this context, the ring or bracelet or necklace is considered as a part of the dowry or gift from the groom to the bride. So this defeats the purpose of the object as a communication object because with this culture, a piece of jewellery can be anything, worn for any purposes.

Consider how the Malay society, by nature, loves to adapt symbolism to their lives, for example, a 'keris' as a symbol of power and strength. Thus, they are more prone to adapt the significance of wedding rings as a sign of one's marital status. This affects the design of wedding rings in the current market to make it a symbol of marriage, universally understood.

To imply that a ring is a wedding ring, and as a portrayal of one's marital status, the ring has to be in specific design or worn in a specific way. For example, like in the western culture, a pair of wedding rings is designed as a plain gold band worn on the ring finger on the left hand.

Wedding rings are to be perceived as an object that speaks for itself. Meaning, without having to declare, a person may portray the ring as his/her marital statement.

Design Outcomes

Wedding rings generally concern the young generation of the Malays aged 20–30. This is because at that range of age is when people would most likely get married. Their choices of designs will determine the significance of wedding rings. These choices are the trend and, in the long run, contribute to developing a neo-Malay

culture. As the majority of consumer in wedding rings, they have an important role to define the significance of wedding ring designs in the Malaysian market.

This study will substantiate the Malay wedding tradition that is currently upheld by in the society. The changes of wedding cultures are beginning to arise, and the context of wedding ring designs is an important element in the changes. The existing knowledge of the Malay wedding culture will be revised with the evidence of new cultures in the current generation.

The variables that will be measured are the age of the population, which in this case is 20–30 years old, the conservative Malay wedding tradition and the influences from other cultures of wedding tradition assimilated in our society, and the traditional designs of wedding rings and the current designs of wedding rings. The relationship of current wedding culture in the Malay society with the current trends of wedding ring designs is to be examined.

The culture of ring exchange is seen as a symbol of a promise by both the bride and groom to spend their lives with each other for eternity. The wedding ring is a sign of one's marital status, to show the society that this particular person is no longer available. This idea which originated from the west is not a negative culture and in fact with a logical sentimental purpose. There is no harm for the Malays to adapt this idea, and the advertising and media agent have been a great influence to instil that idea into our society.

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Chapter 12
"Gasing" as a Commercialized Game Product in Malaysia

Nur Fadhilah Mohd Omar, Mohd Fairus Yusoff, Mohd Shahril Rusman, and Amer Shakir Zainol

Abstract Gasing is one of the Malay traditional heritage games. It involves a combination of two players and a product called the spinning top. This product has been recognized as an intangible traditional game produced by the National Heritage Department, while the National Craft Malaysia has categorized Gasing as one of the art crafts in folk games category. In Malaysia, until now no research has been done in analyzing the designing process to achieve the longest time of the spinning gasing when playing such a game. As such, this research aims to explore the physical characteristic of "Gasing" design and to identify the design process and product development of this craft. The research has been conducted via interview sessions with "Gasing" craftsmen in Malacca, Perak, Kelantan, Johor, and Pahang. The observation method of data was carried out from the "Gasing" craftsmen in order to analyze the making of the product in detail. The research outcomes will be recorded as guidance in developing the commercialized 'Gasing' which also aims to contribute as an alternative way to preserve the genuineness and the popularity of this game in the future folk games product.

Keywords Gasing • Potential • Commercialize • Design

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12.1 Introduction

Gasing is one of the traditional games in Malay society. In this modern era, this folk game is still practiced by society. Gasing is not an elite sport but a traditional game. Usually, Gasing is played in rural areas especially in Kelantan, Pahang, Melaka, Johor, and Selangor. Besides that, some small communities of other states in Peninsular Malaysia still play this traditional game and make the spinning tops. The name of the Malay spinning tops can be defined as Gasing in Peninsular Malaysia [1]. There are 33 different names for Gasing. Each spinning top is different from each other. In designing the Gasing, the design is very important to make this product functional and playable. According to Guopeng et al. (2009) [2], its design is considered as a creative process which combines art and culture such as science and technology. Nevertheless, the study of design and innovation of Gasing is less explored. Current studies by Shamsuddin [3] highlighted the improvement in top spinning using CNC Lathe engineering expertise, but not in industrial design approach. In this case, the statement above clearly indicates that the study on physical characteristic, design process, and product development and craft must be done especially in Malaysia [3]. Habibah Ahmad (2011) mentioned that Wau and Gasing are indeed assets that could help to increase the sale of the craft products which also can attract the tourist and act as the national heritage product in Malaysia. This can be seen in the effort of preserving and regaining the culture and heritage as the core in shaping the individuality to build the nation.

12.2 Literature Review/Background of Study

Gasing

Gasing is a traditional game that is popular in Malaysia. Almost every state in Malaysia has a group of gasing players [3]. Its name is derived from the word "wood swivel chair." It is a blend between wood and swivel "Ka" and "Sing," and if it is called repeatedly, it sounds like Gasing (Mr Rimy Azizi Abd Karim, Bukit Rambai Melaka, September 2013, Personal Communication). There are many myths about the existence of Gasing in Malaysia [4]. Gasing has its own uniqueness which turns very fast and does not fall easily when it is spinning. Studied on the theory of physics, the game Gasing uncharted again [5]. The beauty of its creation has created a game which is widely accepted by the public, but there was a case whereby of which can a Chinese tourist, come to Malaysia, saw the Gasing for the first time and claimed that batteries are causing the Gasing to spin. In actual fact, it does not need any support to make it spin but it needs a unique structure and balance. Gasing is also a traditional game around Southeast Asia. It is found in Indonesia, Brunei, Singapore, and Japan; it differs in size and name because of each country's geographical location that influences its name and shape (Madam Eleeza Zainuddin,

Cultural Centre, Universiti Malaya, Julai 2012, Personal Communication). In Malaysia itself, there are about 100 different names and forms for Gasing (Mr Rimy Azizi Abd Karim, Bukit Rambai Melaka, September 2013, Personal Communication) [6]. In the study done by Yunos Pipet, there are 33 types of Gasing Melayu recorded until 1993. After two decades, Gasing's various types and forms have grown from year to year. In Malaysia, there are some popular Gasing such as Gasing Pangkah and Gasing Leper. Gasing Pangkah is popular around West Malaysia, while Gasing Leper is popular in the East Coast [7]. *Gasing Pangkah* national and international contest goes through PEGAMA. While Gasing Leper has been contested, it was recorded in 2013 that it could turn nonstop for 2 h 30 min. This competition is held only in the states of Kelantan and Terengganu [8]. Gasing is made to be played and used in competitions and used as souvenirs and decorations. Its function will change according to the requirements of the manufacturer of Gasing. For Gasing Warisan Melayu Enterprise, the company produces many Gasing and accepts orders from abroad, exporting a total of 500 Gasing to Germany. When there is a successful company in the global market for exporting Gasing, the opportunity can be competitive (Ismail Muhammad, Persatuan Gasing Kubang Cik Ayu, Binjai Kelantan February 2013, Personal Communicator). In every state in Malaysia, there is a particular Gasing which represents the identity of the state, for example, for Kelantan is the Gasing Leper or Gasing Uri; Johor and Malacca are known for their Gasing Pangkah. Similarly, Selangor and Perak are famous for their Gasing Pangkah. This basic form of Gasing Pangkah resembles a fruit called berembang. In addition, Gasing has three (3) fundamental forms, i.e., Gasing Telur, Gasing Jantung, and Gasing Berembang [1]. In terms of manufacturing Gasing, the wood is the main material which will be discussed in another topic, i.e., the technology in manufacturing the Gasing.

Commercialization/Innovation of the Traditional Product (Folks Games Product)

The word commercialization according to Kamus Dewan (1998) is related to the trading nature which is produced in large quantity and fast and offers a competitive price to the masses. Heritage products such as Gasing can be commercialized and are able to contribute to the economic growth besides being played for leisure or in competition. This concept will produce products in large quantities with guaranteed quality which can be marketed extensively and be able to attract the masses to play Gasing and recognize Gasing as one of national heritages. As stated in [9], the handicraft product is defined as any product that has artistic or traditional cultural attractions and is the result of a process that depends solely or partly on the skill of hand. The most popular handicraft products in Malaysia are batik, weaving materials, labu sayong, flute, jewelry, and pewter. Folk games such as Gasing and Wau are category as forest production or hasil rimba [17]. Commercialization is based on the theories of business. It is different from innovation. Innovation is based on diffusion

Table 12.1 List of companies under national craft Malaysia 2013

Number	Company name
1.	KOLER ATI CREATIF Lot 609, Kg Sanggang 28020 Temerloh Pahang
2.	NOUVO CRAFT & ENTERPRISE No 98, Kg Alor Batu, Kuantan Pahang
3.	*GASING* WARISAN MELAYU No 46, Jalan Keliling, Felda Tenang,85300 Labis, Johor
4.	*GASING* LAGENDA ENTERPRISE 5948-F Rumah Awam 2, Bukit Rambai 75250 Melaka

and comprises of theories [10]. Commercialization definitions within the business community are equally complex, depending on the context. Our roadmap requires a strong basis for analysis, an accepted definition of both from the start. Unfortunately, the scholarly literature is not much more consistent in the use of these terms than in popular use (Koebel and [11]). "Innovation and Commercialization are often used in overlapping ways to refer to the product of discovering knowledge, developing it into technologies, and transforming these into new or adapted products, product and services to be used or sold in the market place" (Isabelle, 2004). Isabelle provides an integrated definition of commercialization as the "process of translating research knowledge into new or improved products, product and services, and introducing them into the marketplace to generate economic activity benefits"[12]. Based on Malaysia's Cultural Arts and Heritage Industry, the term was used in the 9th Malaysia Planning (RMK-9) for the year 2006–2010 under the fourth core (Improvising and Strengthen Quality of Life), Chapter 23, Enriching National Cultural Arts and Heritage. A total value of RM 442.2 million has been allocated for the purpose, and six prospects were identified in enriching national cultural arts and heritage products, by introducing craft industry and craft promotion for world market, being creative in developing cultural industry, and introducing development programs in cultural arts and heritage [12]. Table 12.1 shows the list of companies which are manufacturing Gasing in Malaysia.

12.3 Technology Making Gasing

Lathe Machine

The use of this machine in the production of *Gasing* is important. An example of the machine is the CDM machine. According to Mr. Rimy Azizi Abd Karim (Personal Communicator (Craftsman, September 2013), by using Lathe machine, 40 pieces of *Gasing* can be produced a day. This is supported by Mr. Rimy Azizi Abd Karim (Bukit Rambai Melaka, September 2013, Personal Communication) Mr. Mohd Jais Rozali (Komplek Kebudayaan Negeri Kelantan, February 2013, Personal Communication), and Mr. Pandak Mat Jawi (Laman Budaya Kuala Kangsar, Mei 2012, Personal Communication). Lathe machine is so far the finest machine in making *Gasing* besides using traditional methods. Nevertheless, this process does not

include balancing and finishing. The lathe machine is one of the oldest machines invented for *Gasing* making.

CNC Machine

According to Jones [13], Computer Numerical Control (CNC) retains the fundamental concepts of Numerical Control (NC) but utilizes a dedicated stored-program computer within the machine control unit. Since its introduction, NC technology has been found in lathes and turning centers, milling machines and machining centers, punchers, electrical discharge machines (EDM), flame cutters, grinders, and testing and inspection equipment. Previous studies that linked with CNC machine was researched by Shamsuddin Sulaiman (2011) and his research was on the Plastic which can produce spinning tops [3].

12.4 Research Methodology

Research Design

The researcher has decided to carry out the research with a qualitative approach. This approach is suitable to use, quick, concise, and accurate. This method is very suitable to this research which requires major processing information related to the subject of the research. Research is a systematic process by which we know more about something that we did before engaging in the process. Quantities that are generated by quantitative research, the focus is on how much or how many, and results are usually presented in numerical form by Merriam (2009) [14].

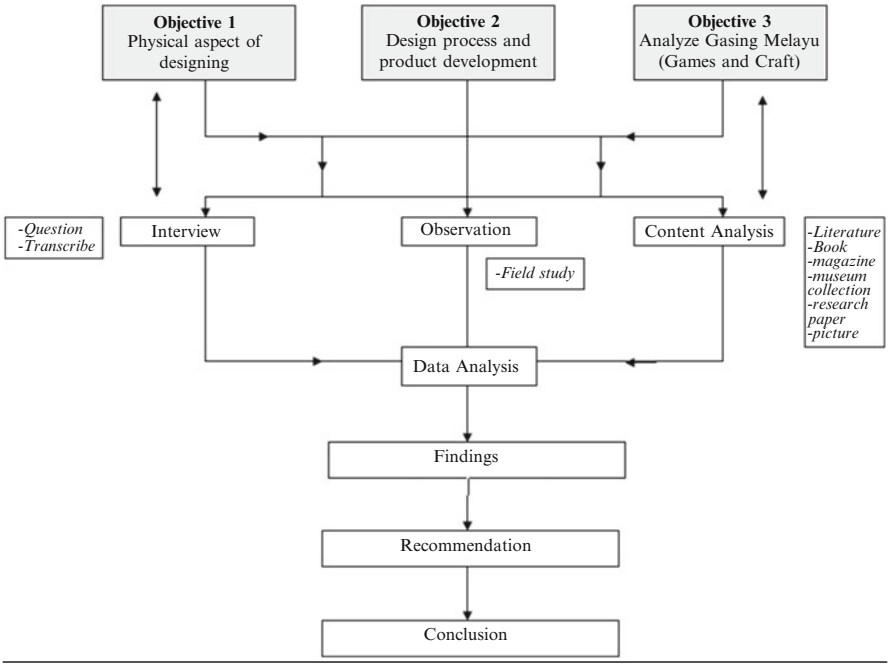
Qualitative Approach

All information from the study was attained, collected, and analyzed based on the objective of the study. According to Lohen (1960), qualitative is working with words not with numbers. There is no quantification [15].

Content Analysis

Content analysis is a quantitative form of analysis; it can examine through what can be counted in the text in any form (image, document, live situation, or interview). In this research, the entire picture from the museum is analyzed in terms of shape, body, form, and aesthetic value. The flowchart describes the physical aspect of gasing which is shown below (Table 12.2).

Table 12.2 Research flowchart



Interview

Interviews are included by asking good questions. Begin the interview by recording and evaluating the interview data and the nature of interaction between the interviewer and respondent (Merriam 2009). This study used the qualitative research approach, and interview is one method of this study. Qualitative research can be in all forms, and occasionally some data are collected through interviews. De Marris (2004) defines an interview as a process in which a researcher and participant engage in a conversation with questions related to the research study (p 55). In this study, we have conducted interviews with four experts in making *Gasing* [14, 16].

Observation

Observation research involves recording ongoing behavior without attempting to do publishing. This method takes two general forms which are naturalistic observation and participant observation from the research by McBurney (1998). Participant observation is when investigators participate and record their observations. This study uses participant observation research. Participant observation is characterized by the effort to view some behavioral activity from the viewpoint of an insider to a

situation. A very careful observation is very important in this research as to understand the process of making *Gasing* from the beginning until the product is ready to be played and sold to collectors or customers. The researcher will observe the way the craftsman crafts and record what has transcribed. The researcher will also record the process by using audio and video recording [15].

12.5 Preliminary Result and Data Discussion

Data were collected by the researchers through interview sessions and observations from 4 *Gasing* maker companies. The Table 12.3 shows the preliminary data collected by the joint researchers of these interview sessions on price, material, function, and motifs from the respondent. From the data collected by the researchers, it is important for the manufacturers to know the market for *Gasing*. It has become an important study that allows *Gasing* to be explored more widely in terms of physical characteristic, design process, and product development. From the study, there are similarities and differences, and below is the discussion for each respondent.

Price

The price sold by the respondent ranges from RM 5 to RM 400. Each *Gasing* is different in terms of function and form. Respondents 3 and 4 have products that have more interesting shapes and patterns. The prices are more expensive, and their handicraft has more aesthetic value.

Table 12.3 Preliminary data

Article	Respondent 1	Respondent 2	Respondent 3	Respondent 4
Price	RM 15-RM 200	RM 5-RM200	RM5-RM350	RM5-RM400
Material	Plastic and wood	Wood	Wood	Wood
Function	Play craft	Craft	Play craft	Play craft
Motif/decoration	Decorative purposes; product uses *Gasing* as subject matter (wedding product)	Decorative purposes; product uses *Gasing* as subject matter	Calligraphic writing and nature patterns	A more decorative home product, e.g., lighting, ship

Material

Materials for making wooden *Gasing* must be maintained so that the originality and uniqueness of *Gasing* are preserved. It gives value to this particular craft and also symbolizes the originality of the *Gasing*. Respondents 2, 3, and 4 agree with this issue. They disagree if this craft is to be converted from wood to plastic, and they uphold their stance. In contrast, Respondent 1 manufactures *Gasing* made of plastic. The transformation is to accommodate the lack of raw materials and also to bring *Gasing* to a higher level. The researchers see that the material used in making *Gasing* provides some implications to the users. Using either wood or plastic, if in the context of a business to commercialize a product, the product must be economical and can be produced in large quantity but in lesser time compared to the traditional way [18].

Function

Respondent 2 only makes *Gasing* for sale as a craft. Unlike Respondent 2, the other respondent makes *Gasing* as a game as well as a craft. In addition, Respondent 4 is planning to use *Gasing* in presentation to the public by showing *Gasing* playing skills on the player's body. Indirectly, this will promote our society especially the young to show interest in playing the *Gasing.*

Motive and Decoration

Respondent 1 manufactures *Gasing* for decorative items such as lamps or decorative containers. Respondent 2 also manufactures *Gasing* as gifts like keychain and replica. Respondent 3 has included craftsmanship of natural patterns to the *Gasing* itself in order for the *Gasing* to be attractive. Respondent 4 uses the *Gasing* as a light decoration, cigarette ashtray, and other home accessories.

12.6 Result

Based on the above findings on price, material, function motifs, and decoration in making *Gasing*, each respondent believes that the *Gasing* not only considered as a game but has other functions. It also justifies that *Gasing* can be commercialized. If the manufacturers put an effort in exploring the design and shape of the *Gasing* to cater the masses, the *Gasing* will have a chance as being one of the sought-after games or handicrafts among the collectors. The researcher also believes that the

companies' performance is moderate. A paradigm shift is required in order for *Gasing* to expand in Malaysian society and penetrate the international market. Among the reasons are small investments due to small returns due to low demand of *Gasing*. In order to make this *Gasing* industry more competitive among other traditional handicrafts, a strategic planning by manufacturers and also the respective government agencies including research and development and marketing plan is done not only to make *Gasing* a well-known game but indirectly generate our country's economic income. For the next conference, the researchers will present the next process and findings in more detail.

12.7 Conclusion

This paper is still in the process of data collection and analysis, and the researchers are still compiling data in spite of the lack of information. Although this study is based on observation, the initiative to create a new approach for industrial design for the reservation of this particular traditional game is the focal point of this study. The researchers will continue an in-depth study of the design and shape of the *Gasing*.

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Chapter 13
Rivet in Ceramic: Method of Past and Present Restoration

Rafidah Bahari and Ruzaika Omar Basaree

Abstract Artistic and cultural heritage objects are affected by the conditions in which they exist, and none are free from the ravages of time and environment. In Southeast Asia in particular, there is an essential need for suitable conservation facilities with qualified and skilled professionals in the field to conduct a concerted effort to preserve heritage. Case Study: Islamic Arts Museum Malaysia intended to study the rivet in ceramic and explore the structure and techniques of rivet in some of the ceramic collection at the Islamic Arts Museum Malaysia. The study observes the existence of the method of the past before introduction of the knowledge about the proper techniques to restore and the suitable material to use for ceramic body up to the present time. Reflecting on this research, some of the ceramic collections were selected to show more detail about the rivet techniques on ceramics, procedures, preventive conservation and techniques. The theoretical framework for this study was based on the theory of Johann Joachim Winckelmann. This research is conducted using qualitative methods through artefact analysis (archival study) and physical observation. The findings from the analytical approach were drafted in data collected and graphically in an open-up view to explore in detail structure as well as the aesthetic value. Finally, the research provides recommendations to understanding the conservation work for the future.

Keywords Ceramic • Restoration • Rivet • Techniques • Preventive

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13.1 Introduction

The oldest such repairs held by the British Museum date around 7000 BC, although the exact date of the emergence of restoration and repairs of ceramic objects is not known [1]. The range of materials used in the past to repair ceramics, in the range of bonding, filling and retouching materials, is wide, but a concise outline of some of the more common ones follows. Prior to the late nineteenth century, the commonly available materials used for repairing artefacts included starch pastes, natural gum and resins, protein and binders, beeswax and fats. The technique was called rivet in the past, but nowadays it is known as a metal clamp repair [2]. Unfortunately rivets usually rust and stain, and break lines also become soiled. These antiquated repairs may become unstable and require re-restoration as times goes by. However, repair works or traditional repairs that were done during the period cannot be described as substandard repair. The repair work was done because the object will be used from time to time until it cannot be used any more. A number of different methods for this repair have been used including riveting, tying, lacing and doweling [3]. Substandard repair was done not to deceive people, but sometimes it can reduce or increase the price of the object. As well as caring for the collection, the main concern is to gain further knowledge and understanding. The need to study the rivet in ceramic and restoration of the Islamic arts or antiques collections is to confirm that the connection of conservations, art, history and material is very durable and interesting and all are linked to every collection.

13.2 Methods

The history of art according to Johann Joachim Winckelmann concerns the method invented for the future to show the origin, progress, change and downfall of art together with the different styles of nations, periods and artists and to prove everything as far as possible, from the ancient monument and artefact now in existence. The method from Winckelmann was similar to the conservation concept that comprises of origin, period, background history, observation, analysis, process and style. All of these methods have always been adapted in conservation to make sure the information and the history are retaining their originality [4]. It is interpreted that the major differences should be taken into account along with the artist's involvement with the process and the level of originality of the process employed. Winckelmann stated that both the experience of the work of art and the understanding of what the artist is trying to do are important. The second being impossible without the first, which leads to the Vasari approach, the biological circle being used. The development is measured by its technical progress, which can be related to the technical progress in conservation such as the method of joining broken pieces and stabilizing the structure and others that are related with technicality in material, chemical and examination.

13.3 Results

The first objective is preventing the artefact from acquiring more damage such as faced with twofold damages, those of the original breakage and those of the riveter. However, it is noted that it is the only solution available for its time. The second objective is obtaining understanding of the positive characteristics of their use which is returning the functionality of the objects. They were not likely to be weakened by exposure to hot and cold water, detergents or grease, as would be the case when using an adhesive. It is for this reason that any modern restoration or conservation treatment should not be considered functional. The third is identifying and observing the method used in the past on ceramics, which has always been challenging, for both the collector and the people working at the museum especially the conservators. Early recommendations for testing restorations included tapping with the edge of a coin. According to one source, one useful test is also the test of smell [5]. Unfortunately, as with most early conservation treatments, the scarcity of written records has burdened the objects conservator with the task of indenturing the materials that were used, either by empirical testing or now with the aid of sophisticated analytical techniques. By understanding and through findings, this thesis can help to study rivet as composite materials used in IAMM's collection, developing suitable protective filling for ceramic objects in different approaches and the removal of substandard repairs from ceramics.

Analysis of Rivet Techniques on Ceramic

This dish, painted with underglaze cobalt, uses a historic restoration technique of joining broken parts together using metal rivets. The technique entails inserting metal staples to bridge both sides of the break using predrilled pairs of holes to anchor the ends of the staple. Although this approach may seem unsightly, it was the only reliable method of joining broken ceramics before the availability of modern adhesives. Through discussion and the analysis on structure and ethic, the repair process avoided removing the rivets as this threatened to loosen the original material and disfigure the dish (Fig. 13.1).

Damaged Areas

Science and art come face to face as scientists apply sophisticated analytical technologies to artefacts from the IAMM's collection. A primary role of conservation science is to identify materials and techniques. This basic information is vital in collecting, studying, exhibiting and conserving art. Scientific examination may be used to confirm a work's age or authenticity or contribute to the history of art and even to develop essential treatment and preservation procedures (Figs. 13.2, 13.3, and 13.4).

Fig. 13.1 Iron rivets are seen holding the dish together on its underside. Underside (*left*) and inner side (*right*) of the fritware dish, China, nineteenth–twentieth century AD/AH thirteenth–fourteenth century, diameter: 9.5 × 45 cm, IAMM Collections

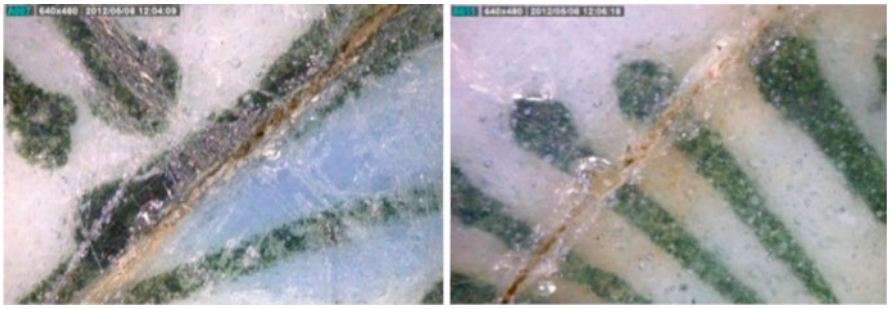


Fig. 13.2 Incorrect procedures can create more problems to the surface and materials

From the result and findings, removing rivet from the ceramic surface was obviously creating damage along the area of the holes and cracks. During the removing process, carelessness should be avoided because the glaze can cause cracks and chippings around the holes. Previous manufacturing process sometimes makes the rivet too strong and difficult to remove. The safe removal was cutting through the middle of the rivet so that each half can be eased away at the correct angles (Figs. 13.5 and 13.6).

13.4 Rivet Removal on Ceramic

To avoid causing further damage to the surface, the removal of rivet needs to be done carefully. There are different methods that can be applied for the removal of the rivet. Some of the researchers recommended simply softening the material

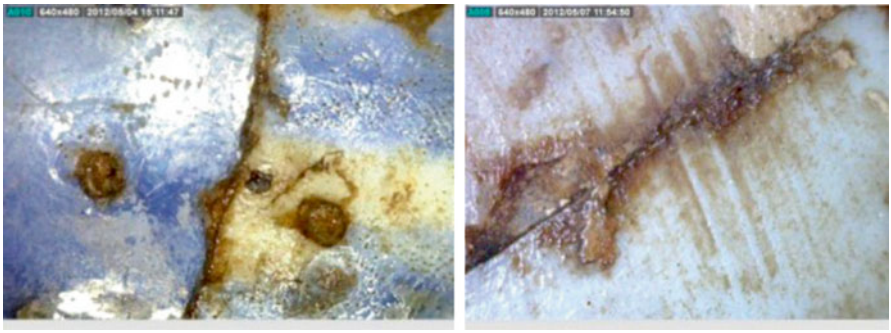


Fig. 13.3 Staining along the crack and inside the holes in the long term can cause permanent stain to the surface

Fig. 13.4 The trace of holes from the removal of rivet, finding the damaged area and filler inside the holes

around the rivet and pulling or levering them out with pliers or a blade or by using a needle slipped under the rivet. This method does have the advantage of speed, but the safest way to remove rivets is to carefully cut them in half and then remove each half separately. The filler inside the holes was first softened with warm water applied on cotton wool swabs and then removed mechanically. Although this method applied water, it caused problems where corrosion appears, and staining can also cause it to be porous. The rivet is then cut in half using a hacksaw blade, a file or scalpel (Fig. 13.7).

According to the Victoria and Albert Museum, London [3], damage to the surface can be prevented during the cutting process, by placing strips of adhesive tape on either side of the rivet. The angle of sawing is adjusted if the blade or file comes into contact with these. It is easier to saw safely through a rivet placed into a convex surface than one placed into a concave one. Once the rivet has been sawed through, the two halves can be extracted separately using pliers, a pulling at a slight angle away from the break (Fig. 13.8). All traces of packing material and any metal stains must be thoroughly cleaned from the holes when all the rivets have been removed [3].

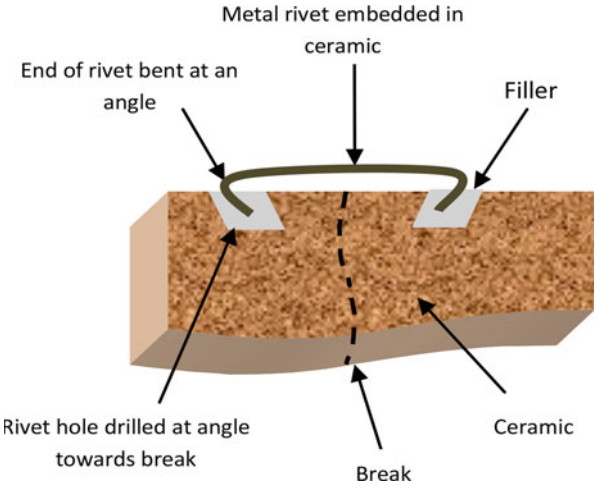
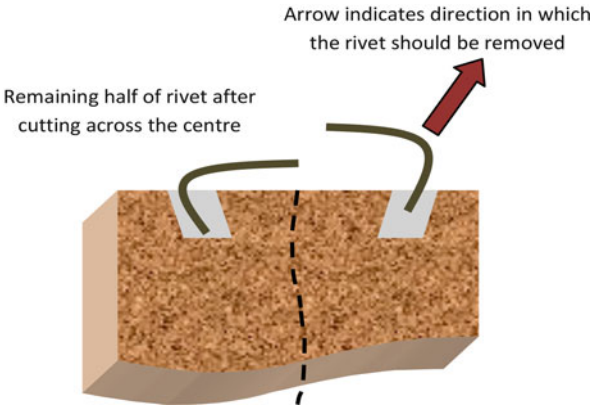


Fig. 13.5 Section through a joint which has been repaired with a rivet

Fig. 13.6 The removal of the rivet after cutting across the centre



13.5 Replacing Rivet Restoration

The elimination of old repair may be required for various reasons. The properties of materials used in the past are such that they do not always endure the test of time. This may become clear in a multitude of ways, including a change in colour, shrinkage, loss of mechanical properties, embrittlement and cross-linkage. In other cases the repairs may have been applied in a way that the results are unsightly, misleading and unsafe. When deciding the best course of action, the safety and historic integrity of the object should always be of top priority. Dismantling and removing old repair are not always necessary, as the risk involved to the object should be fully considered. Old repair may have some intrinsic interest or aesthetic value, and they may

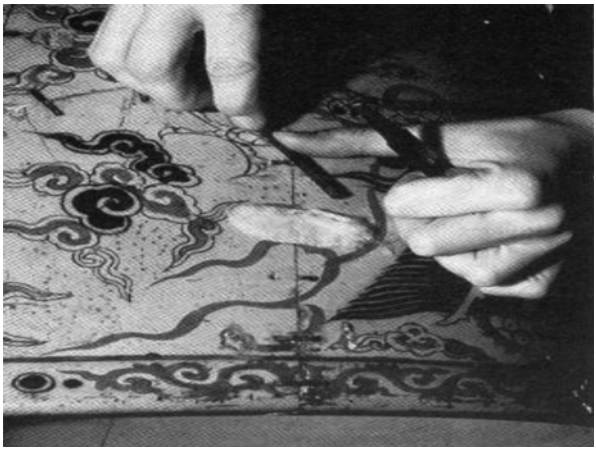


Fig. 13.7 Removing rivets from a Chinese porcelain jar. A rivet is being sawed in half using part of a hacksaw blade

Fig. 13.8 Each half is then removed separately using pliers. The cotton wool swab is dampened with water and was applied to soften the plaster fillings in the holes of another rivet (Victoria and Albert Museum London)

also be appealing in the context of the history of restoration techniques. If a procedure is not severely essential and can be evaded, this may be the best and safest course of action. In some cases, upgrading the existing repair might be possible without having to undertake the full conservation treatment. Such an approach is obviously preferable. The material and techniques are required to be tested for minimum interaction with the object, and it should not interfere with future treatment, aside from being as durable as possible, and will be reversible with minimum damage. Reversibility is a particularly important factor when treating an object. Restoration and reconstruction are treated as methods of returning certain cultural, aesthetical and historical worth that may have been lost with the missing material. It must be carried out only to the minimum degree needed and must be fully documented. The object that ceramic conservators deal with can range from coarse, low-fired pottery to fine, high-fired porcelain and from single shard to multi-part, decorative objects. The treatment that is fitting must be related to an interpretation of 'purpose' of the object as seen by the present owner (Fig. 13.9).

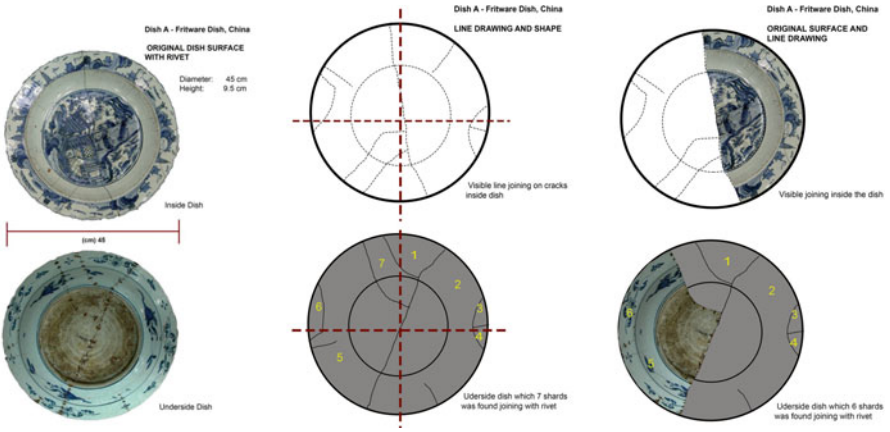


Fig. 13.9 Analysis of cracks under Photoshop effect, fritware dish, China, nineteenth–twentieth century AD/AH thirteenth–fourteenth century, diameter: 9.5 × 45 cm, IAMM Collections

13.6 Conclusion

Many contributory factors caused the use of rivet in ceramic, which proves to be the oldest techniques in ceramic repairs. There is no standard repair in the past during the combination of materials and method. Practical applications and findings have proved that the arrangement of width, length and distance were commonly fixed randomly on the ceramic surface. It enhances the aesthetic demands that some of these practitioners place on their work, and it continued to develop as materials and techniques were refined and no doubt as the market dictated greater visual perfection. There is also the market value to be taken into account as it too may have driven this shift in at least some segments of the market for repairing. Everyday functional objects had to be mended because their owners needed them and could not easily afford to replace them. It is concluded that these objects needed to be fixed only well enough to be used and needed to be fixed well enough to be displayed.

'The china mender differs from the (restorer) for the reason that his assistance is especially required for articles destined for constant use. Strength and durability united with cheapness of workmanship and promptness of execution are sought to the exclusion of any other consideration. The joining by means of clasps and rivets is his speciality and very seldom does he pay attention to the looks of his work'.

From the data collected, the arrangement of the rivet for the three dishes was randomly fixed and did not follow the circulation measurement or the standard fixed for respective techniques. Removal of the old restoration sometimes causes damage to the ceramic body and surface, and it will even remove the original from the objects. The limitation of the research regarding removing the rivet from the ceramic objects is identified as follows: the use of rivets can cause problems as irregular cracks will appear, aside from the loss of compensation on ceramics,

cracking, distortion, appearance of more scratches and loss of historical value and aesthetic. Tracing the method used in the past was very challenging on searching the development of ceramic restoration styles and purpose during that time. It is believed that it has already been noted how different ceramic collections reflect the time at which they were restored as well as the influences of aesthetic taste and appreciation. Interestingly, rivet techniques mentioned above have recently become fashionable again.

The explanation in general will focus on the process to replace rivet techniques that were done in present times. Until now the techniques were used in all museums to repair or restore their ceramic object with reversible material. Retreatment requires the ability to both identify the material and understand its chemistry well enough to remove it. Technical analysis and research by conservation scientists have greatly aided the ceramics conservator in this area, so that these obsolete fill materials can be safely removed without risking damage to the ceramic. Once the ceramic is returned to its fragmented state, the next step is to put the pieces back together. One object from Islamic Arts Museum Malaysia was chosen for the restoration work to be done, and the process should be able to be adopted to other ceramic artefacts or antiques collections.

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Chapter 14
Comparison of Natural and Synthetic Adhesives for Ceramic Conservation

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Abstract This paper discusses the comparison of natural and synthetic adhesives in terms of composition and solubility for ceramic conservation restoration. The role of an adhesive should be identified for its characteristics and suitable use on an object. The aftereffect in conservation process should be considered because conservation is to prolong the life span for future observation. Adhesives used should fulfill the criteria's used in ceramic conservation, which are the character should be reversible, not discolor, easy to be applied, longevity, durability and strength.

Keywords Natural adhesive • Synthetic adhesive • Comparative study for adhesives • Ceramic conservation

14.1 Introduction

The aim of this research is to identify suitable types of adhesives used for ceramic conservation; either natural or synthetic adhesives are best used for application in ceramic conservation. The specific aim is for the ceramic conservators' needs according to the existing adhesives in the market commercially and specific standards.

In dictionaries the definition of adhesives is a substance capable of holding or joining materials together with surface attachment. Adhesives have been used since ancient times. When archeologists study burial sites of the prehistoric era, they will often find organic substance buried with broken pottery vessels. Repairs with some type of "sticky stuff," resin probably from tree sap [1].

The period of time gave further proof that adhesive became a method of assembling. Organic material normally was used in ancient times because of the limitation

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in technology, and natural sources were primary in that era. With the technology today, adhesive is made from chemical combination to produce synthetic types of adhesives.

Joining and bonding in conservation is apart from the important method restoring an object also known as a bridge, and to fill the gaps between shards and object [2]. Each object has its own way on how to be mended, for example, hot-welded iron is held by merging of the metal, and ceramic is mended by fixing the broken pieces with adhesive on the broken surface and joined together according to the porosity or nonporosity of the ceramic piece [3].

In the context of adhesives used, there are various types that are used for bonding and joining parts. For conservation, conservators use generally acrylic resins, e.g., Paraloid B-72, a solvent-based material. To obtain the mixture, it has to be combined with acetone; for adhesive use the quantity of Paraloid B-72 is above 25 %, depending on the viscosity needed. It has quality of reversibility and longevity [4, 5]. The method used depends on the physical properties of the object.

14.2 Basic Types of Adhesives

Natural Sources

There is a number of organic adhesive known since ancient time and also can be use because of its sticky characteristics. From this, animal glue and other types of adhesive were developed, for example, egg whites were used to bond gold leafs. Beginning from the egg whites, other natural substances were tested and used as adhesive such as bones, hide, milk, cheese, vegetable, plants, and animals [1].

Animal skin glues are derived from animal sources that are rich in collagen, such as the skin [4]. The characteristics of this type of adhesive are usually clear yellow to brown in color, shrinks, and becomes brittle after a period of time. This is known as *aging* in the material. Animal glue is made by boiling the material until it forms a gelatin material. In ancient times circa 1500–1000 BC, animal glue was used as furnishing and mural paintings. Broken pottery might also be repaired with animal glues to fill the cracks and hide the imperfections [4].

The similar, protein-based, animal glue produced was the fish glue. Fish glue was produced from the skin and bones of a fish. During medieval times in Europe, fish glue was often used to repair parchments which were used for writing. In the 1800s fish glue also was used for coating paintings, but it seemed to be a brittle material. It will be used with other materials to restore paintings [1].

Another protein-based adhesive which can be considered is the casein glue. Casein glue is made from protein isolated from milk. It creates an adhesive that is waterproof and was first used in bonding the seam of cigarette paper. Its character is fast setting where 1 g of adhesive can bond up to 2,000 cigarettes [1].

Other types of adhesives which are listed from natural sources are, for example, bitumen, beeswax, plant sap, starch extracted from plants, and cellulose nitrate from natural polymer found in trees and woody plants.

Synthetic Adhesives

After decades of the starting of modern technology, synthetic adhesive started to be used as a replacement of the organic adhesive. It started to be produced since the development of plastics and the change and improvement of various properties of adhesives, such as flexibility, toughness, curing and setting time, temperature, and chemical resistance [1].

Synthetic adhesives refer to glues which have gone through a process wherein it is combined with specific types of chemicals to form a sticky composite. Looking back, synthetic adhesive existed from the natural sources in adhesive which was used before its existence. Without its existence, synthetic adhesive will not be notified.

Today there are a lot of types of synthetic adhesives, for example, epoxy resins, polyvinyl acetate, Paraloid B-72, and many more. The more discoveries in modern science and advanced technology, the more advanced the outcome becomes in terms of development of adhesive.

Epoxy makes an excellent adhesive, consolidant, and gap filler. Various epoxies are made by reacting two or more chemicals which are called hardener or catalyst, and the other half is resin. Other than that, the epoxy can be modified to change their physical properties, for instance:

- Flexibility for impact resistance
- Diluents or solvents to reduce the viscosity fillers
- Reinforcement like glass fiber, alumina, silica sand, clay, metal powders, and flakes to change properties such as heat and electrical resistance, strength, and adhesion to certain substrates or materials

Epoxy can bond a wide variety of materials because of its high strength in bonding. Using epoxy can also bring the following negative effects: it will leave a stain if not properly applied, and when aging, it may become yellowish in color.

Polyvinyl acetate or PVA is used both as consolidate and adhesive. PVA has good stability to light and does not yellow. It will remain soluble and does not cross-link and become irreversible. Many conservators use PVA because of its strong concentration especially pottery construction; however, occasionally the broken pieces mended using PVA will fall apart because of excessive cold flow of the resin in hot, humid storage conditions.

PVA has some shrinkage character that may damage a treated object and will distort fragile thin pieces, textiles, thin painted surfaces, and other same objects.

Paraloid B-72 is a substance which is chemically made to be used as an adhesive and for long-term stability. The substance is durable and non-yellowing acrylic resin which is soluble in acetone, ethanol, toluene, and xylenes [6].

The character of Paraloid B-72 has stability, easy reversibility, moderate strength, fast setting, and low cost. B-72 is known to be more permeable than epoxy resin to water vapor and less to trapped moisture [6].

14.3 Types of Adhesives Used for Ceramic Conservation

Tables 14.1 and 14.2 show the types of commercial adhesives used for industrial or household purpose. There are no preferences to any brand stated above. The brand name is a given example for most commonly used adhesives obtained in local market. The table above shows types of commercial adhesives used to mend ceramic. The adhesives can be applied but are not suitable for restoration in conservation. This will bring negative side effects when used in the long term and react toward its environment.

Table 14.3 shows the negative effects when using commercial glues for ceramic restoration. The glues can be used but only for a limited of time.

The objective of this paper is to compare types of adhesive between natural origin and synthetic origin for the use in ceramic conservation. Based on today's technology, the natural sources have been a binder method from ancient time has a possibility to be modified to be used as an adhesive for ceramic conservation.

Table 14.1 Commercial adhesives

	1	2	3	4	5	6	7	8	9
Ceramic		×				×		×	×
Glass		×				×		×	×
Paper	×	×			×	×		×	×
Wood		×	×				×		×
Fabric	×	×		×	×		×		
Metal						×		×	×
Organic material	×	×			×	×	×		×

Table 14.2 Type of glue and brand name

Type of glue	Brand name
1. Polyvinyl acetate (PVA)/craft glue	Fair bro PVA White Glue
2. Hot glue	Ad Tech Glue Stick
3. Wood glue	CHEMI-BOND
4. Fabric glue	Vital Technical
5. Spray adhesive	3 M Super 77
6. Super glue	Windsor
7. Rubber cement	CHEMI-BOND, V-Tec
8. Silicone adhesive	Bossily
9. Epoxy	CHEMI-BOND, UHU

Table 14.3 The use and negative effects

Types of glue	Negative effect	Risk
Hot glue	When the temperature fluctuates, the joint ceramic will expand	Separation and surface lost
Super glue	Low shearing strength can be used as a temporary glue agent, brittle	Joining of shards will not give good results as they may break if not handled with care
Silicon adhesive	Change of color to yellowish, and if not chosen well, it might have smearing of oil substance	The joining will be seen clearly, and if it separates, it might take some particles
Epoxy	Aging effect and change of color from transparent to yellowish and may melt in hot temperatures	Same risk as silicon adhesive

In the practice of ceramic conservation, historically, the use of shellac, animal glue, cellulose nitrate, and polyvinyl acetate has been used for restoration [7]. For ceramic conservation, adhesive is chosen based on the type of ceramic body, whether it is hard porcelain and glazed or unglazed earthenware. A conservator also must carefully observe an object from the aspect of the dimension, form, and its composition. It is reminded that the adhesive should be soluble.

In conservation, according to the general rules and regulations for applying adhesives, it should be reversible without any risk of damage to the object, it must be strong and durable and have low viscosity, it should be clear and colorless, it should not stress during curing time, it should be suitable for the object and environment, and it should be safe for use by the conservator.

In the Islamic Art Museum Malaysia, Conservation Department, the standard adhesive used in ceramic conservation is Paraloid B-72 and epoxy. However, this depends on the character of the ceramic object itself whether it is porous or nonporous. Planning and preparation is important to be carried out before the start of working on an object.

Characteristics and Properties

1. *Reversibility*: It is important to know the reversibility when applying an adhesive for joining a ceramic fragment because applying it on a porous surface may affect the surface where it will be difficult to be removed caused by the liquid still trapped in the surface.
2. *Strength of the bond*: The adhesive used to bond broken ceramic pieces must be strong and able to hold them together and cannot stress the object in the future because it may cause fresh damage.

3. *Viscosity*: The viscosity of the solution should be compatible with the ceramic surface, meaning the physical structure whether it is porous or nonporous [8]. If the ceramic is porous, a low-viscosity adhesive will be sucked into the body leaving very little behind causing the joining to fall apart. Meanwhile, using the same mixture on a nonporous ceramic surface as joining will create a very tight joining [9].
4. *Appereance*: To apply an adhesive, it should be clear and colorless according to the object condition.
5. *Shrinkage*: In choosing an adhesive for the conservation process, one should make sure the adhesive should not shrink.
6. *Long-term aging*: In fixing an object, it is advised to use adhesive which is durable and stable in its environment and would not harm the object in the future.
7. *Application*: The adhesive should be easy to be prepared and applied, pot life (the time the adhesive remains workable after mixing) [3]. Some adhesives have to be measured which sometimes bring errors when applied.
8. *Health and safety*: Before using an adhesive, it is important to know the content and pay a close attention on the safety and health guidance.
9. *Planning*: Planning before conserving a broken ceramic is to know which part is to be mended first.

Figure 14.1 shows images on how to plan the part-by-part structure before joining a broken ceramic piece. Both figures show it starts with the biggest fragment until the smallest. This is to ease the joining process which may avoid the structure to be fitted perfectly. For example, if A and C will be joined first, B will be locked out.

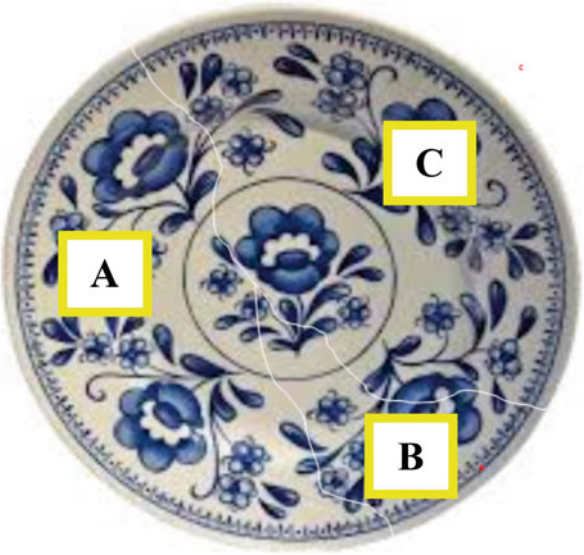

Fig. 14.1 Assembled broken ceramic piece

14.4 Comparison Between Natural and Synthetic Adhesives

Table 14.4 compares natural and synthetic adhesives and identifies which of these adhesives are soluble and non-soluble in water or other types of solvents. This can be used as a reference on when and how to use the adhesive based on its content.

The choice of material for the conservation of a particular ceramic object must be made after consideration of the properties required for the material [10, 11].

Based on a large ceramic collection, which mainly comprised historical objects, in the Islamic Art Museum Malaysia, majority of the objects have been preserved using Paraloid B-72 if needed to bond, mend, or stabilize cracks, which may break if not treated in the long term. The characteristic of a historical object is different because of the content in its material or glazing which was produced many years back.

According to the experience of ceramic conservators in Islamic Art Museum Malaysia, Paraloid B-72 is suitable for because it fulfills the specific standard requirement based on the conservation ethics for adhesives. The consolidant is much stronger than polyvinyl acetate without being extremely brittle and more flexible and tolerates more stress or strain on a joining. However, ceramic conservators still depend on the market for applicable commercial glues similar to Paraloid B-72 for the present or the future.

Since, for commercial purpose, the target group of ceramic conservators worldwide is not a major target group, conservators have to rely on products which are more profitable and manufactured for the general market. Conservators are normally

Table 14.4 Adhesive comparison

Natural adhesive	Synthetic adhesive
Carbohydrate-containing binders	**Paraloid B-72**
Honey – soluble in water	Can be diluted with 50 % above Acetone with Paraloid B-72 for adhesive
Plant gums – soluble in water	Soluble in acetone
Protein-containing binders	**Epoxy resin**
Animal glue – soluble in hot water	Insoluble, will soften and swell in commercially available paint strippers
Egg white – soluble in water	
Egg yolk – insoluble in water	Allowing to produce adhesives with either fast ambient cures, high-temperature cures, or one package system with extended shelf life [10]
Casein – may or may not be soluble in water	
Others	**Polyvinyl acetate**
Drying oils – as liquid, may be dissolved in organic solvents, insoluble thereafter	Warm water or acetone may split the bonding but ethanol mixed with water works effectively.
Beeswax – soluble in organic solvents (such as turpentine) may also be melted	
Natural resins – some are soluble in organic solvents; some become less soluble as they age	

using products which are prepared for another purpose and have to be modified. The products on the market have to be made useable for preserving valuable objects of national and world heritage.

The cooperation between and interaction of the relative small group of ceramic conservators and the industrial entities manufacturing adhesives will be for the benefit and advancement of both the conservators and their goal in preserving heritage and the industrial production, aiming at offering durable adhesives for general market.

14.5 Summary

Adhesive is one of the important materials to be used in bonding. Paraloid B-72 has suitable properties and characteristics in bonding ceramic fragments. This is because it is reversible and colorless and may prolong an object's life span without harming its physical structure.

However, adhesive with natural substance which does not content any chemicals is not suitable to be use for conserving a ceramic object. This is because natural-based adhesive may trap moisture and dust which can bring other problems such as mold and fungus growth. It also will make the joint fragments unstable.

Future research can be done for natural adhesive which possibly can change the use of too much chemicals, or with the technology today, an adhesive can be created using the same natural substance but changed to have the same characteristics and properties with Paraloid B-72.

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Chapter 15
Interrater Agreement for Process Loss Measures: Are They Applicable for Brainstorming Technique in Industrial Design Practices?

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Abstract The importance to examine the types of analysis is always emphasized by researcher(s) because not all work is absolutely done at individual level. Playing football, building an academic module, and developing new design need the group to work to complete them. Therefore, individual-level analysis only is not sufficient. It needs researchers to look at the different angle of analysis, group level of analysis. By using group level of analysis, this study aims to examine the measurement of group process in the industrial practices. The formula of James et al. [13] is used to make a verification of interrater agreement. A total of 460 undergraduates from six universities have engaged in brainstorming sessions. The result clearly shows that the three measures of process – production blocking, social loafing, and evaluation apprehension – can be acceptable in using interrater of agreement on group work in design practices especially industrial design.

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Keywords Interrater agreement • Brainstorming • Art and design • Creativity • Idea generation • Process losses

15.1 Introduction

This progression has related with the production loss on group process and ownership of the topic. There has been a strong emphasis in the study of group brainstorming on idea generation, also known as group process [6, 21]. In other words, group process should be an important determinant of the group brainstorming performance. Although there are several processes as involved in brainstorming, most of the brainstorming researchers such as Kerr et al. [14], Diehl and Stroebe [7], Shepherd et al. [23], and Bolin and Neuman [5] agree that three prominent factors of production loss always disturb the brainstorming performance: production blocking, social loafing, and evaluation apprehension. Moreover, production blocking represents cognitive process, *social loafing* represents the motivational factor, and evaluation apprehension represents the social psychological factor [19]. Production blocking is defined as competition for speaking time in the interactive group [7] while [1] evaluation apprehension is define as individuals in the group feeling fearful that their creative ideas would be evaluated and would entail retaliation in the group; *social loafing* can be defined as a decrease in effort when individuals perform in a group [11, 16]. Production blocking is referred to as competition for speaking time in interactive groups [7]. Production blocking is defined as the fact that only one person can speak at a time, other group members are waiting for their turn, and the waiting time would entail a loss of productivity in the brainstorming group [8]. Production blocking occurs when individuals in the group cannot express their ideas because the other group members are talking at the same time [9]. *Social loafing* can be defined as a decrease in effort when individuals perform in a group [11], and it occurs only when their ideas are not identified or attended to by other group members [15, 21]. The term "social loafing" has the same meaning as free riding, in which individuals in a group try to limit their efforts to produce creative ideas [1]. Evaluation apprehension is a situation in which individuals may fear a negative reaction from other group members and they withhold their ideas in the brainstorming group [7]. Similar to the definition by Diehl and Stroebe [7] and Barki and Pinsonneault [1], evaluation apprehension is defined as the feeling of individuals in a group who fear that their creative ideas would be evaluated and can entail retaliation in the group.

Although brainstorming is a most powerful method to gain ideas in industrial design practices, very little studies attempt to measure the process of brainstorming at group-level analysis. Most of prior literatures emphasize on individual level of analysis. Only in the early 2000s did the group level of analysis become a tremendous study. Based on the importance of the above case, this study aims to examine the measurement of group process at group level of analysis in the industrial practices. Group-level analysis is a new approach in order to measure attribute especially in group work.

15.2 Aggregation of the Personality Traits, Production Loss, Satisfaction, and Ownership of the Topic

A very prominent and classical point of view in the case of group work that is preferred by researchers is by Heslin [12]. The study of individual selection in team setting should be preferred [18]. Therefore, Bolin [4] and Bolin and Neuman [5] in their study put forward that researcher should take into account the impact of group-level personality in performance, so that they would not be drawing incorrect conclusions. In this issue, following the method of how to operationalize the personality in-group, Heslin [12 and Barrick et al. [2] suggested that the most common operationalization is to calculate a mean score for the individual measured. This approach assumes that the amount of a characteristic possessed by each individual member increases the collective pool of the characteristics. That is, more of a trait is always better or worse, regardless of how that characteristic is distributed among team members.

Nevertheless, Barrick et al. [2] added that the mean score of individual measure sometimes created a problem because aggregation cannot give the important information when individual characteristics do not combine additively to form a collective resource pool. The second method that is always used to operationalize team composition focuses on the variability of individual characteristics. Such measurers are frequently used to capture differences in team composition that are masked by the mean. Therefore, a focus on the variance of traits is appropriate when researchers seek to understand the relationship of team composition homogeneity to team process and team outcomes. The third approach focuses on the highest or lowest individual-trait score for the team. Focusing on the highest or lowest individual-trait score of team members is therefore appropriate in situations where one person has an inordinate effect on team success [2]. Finally, Barrick et al. [2] have given the suggestions that the suitability of operationalization depends on the nature of the task that will be completed by the group, the research question being asked, and the specific traits being analyzed. Therefore, in this case, Barry and Stewart [3] emphasized that group-level analysis is an appropriate method to be used. Expanding to the related discussion above, Halfhill et al. [10] in their meta-analysis have found that in in-group performance research, the most operationalized personality is the mean.

From matter occurred, [20] also addressed the personality composition of a team as team personality elevation (TPE): a team's mean level on a particular personality trait or set of personality traits [20]. For example, if a team has high TPE on Extraversion means that for a team as a unit, a member in that particular team is sociable, talkative, and assertive [2]. This has been acceptable because the project team is depending on the team, not on individual members [22]. On the issue of group research, Kerr and Bruun [15] and Harkins and Petty [11] emphasized the importance of determining the type of group. By referring to Steiner [24], the type of group could be identified [15, 11]. Expanding to the issue of aggregation of personality traits in-group, [24] has explained the justification in terms of task in-group clearly. A task, according to [24], is a "job assignment" that would be achieved by

the group. Classifying the task into four categories, the first category is a disjunctive task. It is referred to task that is determined by the best group members [24].

The second category is a conjunctive task. It is referred to task that is determined by the worst group members. An additive task is the third category. It is referred to task that is determined by the sum of all members' contributions. The last category is a compensatory task. It is referred to task that is determined by the range and distribution of responses within the group (one man, one vote). Regarding the statement, Steiner [24] also said that "In real life, many tasks are additive" (p. 33). Although there are several methods to operationalize the group personality including the mean and variance, the most popular method is the average (mean) of group members' scores on personality measures [17]. Toward the explanations Barry [3] has related with the test group-level analysis, "it was necessary to aggregate individual responses on the group process measures" (p. 71). By exposing to the progressions, the aggregation will be completed by calculating group averages for the entire task and focus [3]. However, aggregation is not appropriate when the study is focused on the individual outcomes [22]. In this case, researchers should be aware because if the group-level analysis and group performance are not taken into account, the tendency to incorrect conclusions is there [3]. Finally, it is suggested that in order to operationalize the personality in additive task like brainstorming, the appropriate method is by calculating the mean level of trait.

15.3 Problem Statement

The lack of group-level analysis done by researcher(s) may involve the crucial and tiring process of analysis. The researchers should initially transform the data from individual to group. Secondly, they must also use the formula of interrater agreement such as that suggested by James et al. [13]. Understanding the applicability of formula is also difficult for the researcher(s). The other issue is whether the result of interrater agreement in terms of cutoff point (.70) also makes researcher(s) anxious. The situations above may influence the lack of group-level analysis conducted especially by novice researcher(s). Even though this circumstance is seen as difficult, the researcher(s) has no shortcut in terms of data analysis in order to have a good data, which is eventually an appropriate generalization especially in group work.

15.4 Research Methodology

Production Blocking – In this study, an adapted version of production blocking [4, 5] was used. This instrument was aimed at measuring production blocking. Originally, this instrument contained 12 items [4]. These items were measured based on five-point Likert scale that range from "strongly agree" to "strongly

disagree." Production blocking included items such as the following: "It was hard to know when it was my turn to talk," "It was hard to concentrate on my ideas while others in the group were talking," and the reverse item "I felt I could speak up whenever I had something to say." After an exploratory factor analysis (EFA) was done, only seven items were used by Bolin [4] and Bolin and Neuman 5] in the published journal. The internal consistency coefficient of seven items was also high (Cronbach's alpha = .82). Overall, Bolin [4] and Bolin and Neuman 5] showed that this instrument was very good and suitable to measure production blocking in-group brainstorming. In the pilot study, the researcher used all 12 items to measure production blocking in brainstorming session among Malaysian Industrial Design undergraduates. Although Bolin and Neuman [5] used only seven items in their study, the researcher assumed that all 12 items were meaningful in the Malaysian context. *Production blocking* has undergone the procedure of translation and back translation technique. The *social loafing* in this study was to measure the adaptation version from *social loafing*-based [4, 5] procedure. This instrument was aimed at measuring the social loafing. Formerly, this instrument contained 13 items [4]. These items were measured based on five-point Likert scale that ranges from "strongly agree" to "strongly disagree." *Social loafing* had an item such as "I didn't try very hard to help complete the group task" and "I really didn't take this task seriously." The reverse items such as "working in a group helps me feel motivated" and "I was very motivated to generate quality ideas" were provided. After exploratory factor analysis (EFA) was done, only eight items were used by Bolin [4] and Bolin and Neuman [5]. The internal consistency coefficient of eight items is high (Cronbach's alpha = .82). Overall, Bolin [4] and Bolin and Neuman [5] showed that this instrument was very good and suitable to measure social loafing in-group brainstorming. In the pilot study, the researcher used all 13 items to measure *social loafing* in brainstorming session among Malaysian Industrial Design undergraduates. Although Bolin and Neuman [5] used only eight items in their study, the researcher assumed that all 13 items were meaningful in the Malaysian context. *Social loafing* has undergone the procedure of translation and back translation technique, and some modifications were made.

Evaluation Apprehension – In these studies, an adapted version of *evaluation apprehension* [4, 5] was used. This instrument was aimed at measuring evaluation apprehension. In the beginning, there were 11 items [4] in this instrument. These items were measured based on five-point Likert scale that ranged from "strongly agree" to "strongly disagree." Sample items included "I felt apprehensive about sharing my ideas with the group" and "I didn't express all of my ideas because I didn't want the members of my group to think I was weird or crazy." The items such as "As a group, we listened to everyone's ideas" and "I was at ease during the idea generation session" represented the reverse item of evaluation apprehension. After exploratory factor analysis (EFA) was done, only seven items were used by [4, 5]. The internal consistency coefficient of seven items is also high (Cronbach's alpha = .82). Overall, Bolin [4] and Bolin and Neuman [5] showed that this instrument was very good and suitable to measure evaluation apprehension in-group brainstorming.

15.5 Interrater Agreement for Aggregation

The prominent formula of interrater agreement to determine whether the measurements can be accepted or not is by James et al. [13]. Prior studies such as [4, 5] have used this formula in their works. Interrater agreement is determined by using the formula written in Eqs. 15.1 and 15.2 proposed by James et al. [13]. The purpose of interrater agreement for aggregation is to examine how far the differences of individual score in the group could be changeable [13]. This situation indicates that the participants in the group should have the same tendency in every single item. It is also justified when the group members have high agreement. The lack of agreement in the group means that the members in the group do not share the same intention. According to [13], if the interrater reliability coefficient achieves ($R_{WG(J)}$ = .70) and above, the data is appropriate to be aggregated to the group level. The formula is shown as below:

$$R_{WG(J)} = \frac{J\left[1-\left(S_{Xj^2} / \sigma EU^2\right)\right]}{J\left[1-\left(S_{Xj^2} / \sigma EU^2\right)\right]+\left(S_{Xj^2} / \sigma EU^2\right)} \tag{15.1}$$

$$R_{WG(J)} = \frac{J\left[1-\left(S_{Xj^2} / \left(A^2-1\right)/12\right)\right]}{J\left[1-S_{Xj^2} / \left(A^2-1\right)/12\right]+S_{Xj^2} / \left(A^2-1\right)/12} \tag{15.2}$$

where

J = the number of item

S_{Xj^2} = variance

$$\sigma EU = \frac{\left(A^2-1\right)}{12}$$

and

A^2 = scale (e.g., 1–5, 1–7)

15.6 Conclusion

In this study, the variance based within group interrater agreement was calculated using software Excel. It was done for each of the production blocking, social loafing, evaluation apprehension, ownership of the topic, and satisfaction variables. All the variables had a within-group interrater agreement above (.70) and mean interrater reliability for production blocking ($R_{WG(J)}$ = .70), *social loafing* ($R_{WG\ (J)}$ = .93), and evaluation apprehension ($R_{WG(J)}$ = .80), respectively. Like almost all past

researches, this study also has several limitations that should be looked into. This is because the result presented should be taken into account, as well as the limitations. First, this study is limited within the public universities in Malaysia, which offer the program of Industrial Design. Thus, the sample did not represent all Malaysian Industrial Design undergraduates' universities. The private universities and colleges were not involved in this study. Hence, in order to enhance the generalizability of the findings of this study, involving the private universities and colleges is suggested for future studies. Second, this study is extended to all public universities across the country rather than focusing on one university. However, this study is limited to undergraduates who take the program of Industrial Design in public university in Malaysia. Any attempt to generalize the results of this study to any other area of design must be proceeded with caution. Third, although some possible variables such as time of brainstorming, topic that is given in brainstorming session, and the number of members in a group that may influence the quantity of ideas are controlled, the use of brainstorming session in this particular study is limited, whereby all possible extraneous variables are not controlled. This is because the facilities such as experimental lab may make it difficult to manipulate all independent, mediating, and extraneous variables. Based on the results in this work, it clearly indicates to us that group-level analysis should be done in order to have an appropriate conclusion to be inferred to the population.

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Chapter 16
Stoneware Clay as a Replacement Material for Artificial Reef Design

Abu Nain Umar, Zainal Zakaria, Rusmadiah Anwar, and Oskar Hasdinor Hassan

Abstract Based on this research, the researcher aims to create a new design, and there were studies proposed to contribute an artificial reef design for the marine life. This is because the natural corals are not enough to help the corals grow on their surface and body. This study also aims to help marine life to find food and shelter because currently the natural artificial reef is not enough for marine life due to many natural corals becoming extinct. However, the artificial reef becomes an alternative to help the corals grow. The design process will be developed depending on the marine life park. This is to investigate whether this design is suitable or not on that location. However, artificial reef becomes an alternative for easy coral growth in the sea. After that, we are moving towards the design structure, technical consideration and pilot test to get data. The artificial reef design is created as an alternative for corals to grow and also for marine life to find food and shelter.

Keywords Artificial reef • Stoneware • Design • Porosity • Coral

16.1 Introduction

The function of corals for marine life such as fish is to find food and serve as a shelter. The natural coral also shows beautiful colour and serves as a decoration in the sea. Corals are found in the ocean all over the earth. Some live in the shallow

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water [1]. Currently, the natural artificial reef is not enough for the marine life because many natural corals are extinct. However, artificial reef becomes an alternative for easy coral growth in the sea. After that, it is important to determine whether coral can grow on ceramic stoneware or not. Ceramic stoneware is best used to create the artificial reef because it is porous and strong. Besides that, the materials used now are more of wastes and recycled materials. Researchers are using ceramic stoneware to replace materials for artificial reef from waste materials or recycled materials. In this case, researchers need to do research about the suitable design for the marine life, such as fish to find food and shelter easier, and to determine coral growth on porcelain body. In this research, the researchers also need to decide the best location to place the artificial reef by having reliable and detailed ocean bottom characterization data as it is necessary to properly site and design the artificial reef [2]. According to N. Marshall, artificial structures in the marine environment are a response to this need through providing additional spawning ground and nursery habitat [3]. Also according to T. Takeda, the majority of marine species are dependent on artificial reef for food source and sanctuary [4]. There are thousands of coral species in our underwater world. Some live in shallow coastal waters. Others live in waters up to 20,000 feet (6,000 m) deep, as reported by Deborah Coldiron, Underwater World, 2008 [1]. Based on this research, in the sea, there are thousands of coral life species. We are not limited to focus the species of coral, and we are creating the new design using stoneware body for helping coral growth.

We call a single coral polyp. There are many kinds of corals. Stony corals are the best known, and they have soft bodies but make hard outer skeletons for themselves. New corals then grow on top of these skeletons. Thousands and thousands of corals may make up a single reef [5]. The development of concrete artificial reefs (ARs) took another turn whereby the construction was steered towards attracting and enhancing specific marine commercial species through target species ARs [3]. Based on this research, concrete is a limit to create design. Using stoneware clay, we can produce a variety of designs and techniques.

16.2 Material

Based on this research design, stoneware body was chosen from Sabak Bernam, Selangor, as a replacement material for artificial reef. This is because stoneware body can be designed easily. Stoneware is one of the body types in the ceramic material's body. Stoneware body is ranked above ceramic materials because stoneware is famous among ceramic artists when creating sculptures. Stoneware body can withstand high fire; thus, it is suitable for artificial reef. According to S. Salehi, stoneware body that is usually high fired is most favourable for the ceramists. The body strength is one of the factors that ceramic artists focus in their artwork production process [6, 7]. This is a pilot test in the lab to produce artificial reef product. Prototype is made out before making the artificial reef. This design is to show the ideation and installation of sculpture in the sea.

16.3 Conventional Artificial Reef Design

The artificial reef is an alternative to help easily coral reproduction. The difference between artificial reef designs and the natural coral reef is that the artificial reef is made by human to create design for coral. Artificial reefs also can be classified according to their structural design, depending on the purpose of the reef [8]. Fossil, stone, wood and the other aspects of the sea life create the natural coral reefs. The artificial reef is made of materials like rubber, concrete, metal and others. But for this research, we want to produce stoneware body as a replacement for other materials. The existing design of the artificial reef does not give a big impact on the value and element of art. However, in this research, we want to produce a design with elements of art using Malaysian heritage theme. The design that will be developed depends on the subject matter, theme and location. The design that is innovated from the present design is better. Based on this research design, it will be developed to create easier methods for marine life to find food and shelter and to show the elements of art.

The traditional pattern theory, if there is any change in direction, height, size or perspective between two patterns [9]. In the process, we should spread our ideas and thoughts as far as possible and make itself of all the accumulation. It must be a process of firm foundation and a wide array. It is necessary for designers to get inspired and be creative through thinking by perception [10]. Unique art quality and profound artistic content of traditional living ceramic give so much inspiration to the modern one [10]. Based on this study, using stoneware clay, we can create an artificial reef and sculpture in the sea. Artificial reef stoneware body also can be used as a shelter for marine life and a food source. At the same time, artificial reef can help reduce the wave current speed to the shore and can reduce soil erosion. Artificial reef can also be used as a breed to reduce wave current speed. These new breakwaters were designed to better retain the sand and hence continue the protection to that part of the coast [11]. The artificial reef needs to be measured on the duration required to breed coral under the sea. This is to maintain the artificial reef from being broken.

16.4 Stoneware

According to S. Salehi, though many similar researches have been done, it can be seen that industrial waste as raw material or a part of raw material in same production process or different. Ceramic also as part of the art industry can be a high-potential base for use of industrial waste as an alternative theme [6]. Based on this research, raw materials were produced in the same or different production process. This indicates that the stoneware clay is not only used as domestic items but also in different production processes, as the purpose of this paper is

to create artificial reef sculpture design. Other than that, ceramic is a potential material for several industries. According to Ahmad Ali, in 1983, the Fisheries Development Authority of Malaysia (FDAM) locally known as *Lembaga Kemajuan Ikan Malaysia* (LKIM) also constructed ARs, locally known as 'unjam-unjam'. Ceramic was used to build unjam-unjam attaching iron bar as its frame. This technology was said to be originally from South Korea [5]. Ceramic material very closely similar to the natural reef materials such as ceramic stoneware is produced from clay and mixed with other materials to produce plasticity, which is simple in design and used for firing. Ceramic appears to absorb heat and to be long lasting.

Local stoneware collected from Sabak Bernam, Selangor, will be used in the artificial reef replacing the material for creating the sculpture in water. Stoneware clay is easy to fabricate, is easy to obtain, and is affordable compared to other materials. Moreover, the results of this product after glaze firing are more interesting and the finishing looks are more beautiful than the cheaper clay such as red clay and earthenware. It is contrasted by using porcelain. Porcelain has greater effects after glaze firing, but the problem is in the form of hard porcelain and its cost, which is expensive. Experiment is conducted to evaluate the shrinkage of stoneware material. This paper aims to identify the possibility of stoneware clay to be put into the salt water. Stoneware body is porous, and we can adjust it to get more or less porosity. According to S. Salehi, stoneware body that is usually high fired is most favourable for the ceramist in their artwork pieces [6]. Data is collected based on the shrinkage data from the stoneware test bar.

16.5 Methodology

For this study, the researchers need to experiment and investigate the development of design for artificial reef. The researchers need to do some research to produce a design for marine life to help it find food and shelter. This artificial reef design also helps corals for their easier growth.

Figure 16.1 shows a graph chart of what we need to do for this research. Several data were gathered from quantitative method and development of design from an existing artificial reef. Conclusion may be formed that catch yield in the following months can be made as a measurement to ensure the growth effectiveness of the artificial reef or otherwise [4].

For this case study, researchers focus on stoneware as a replacement material for the artificial reef. The design will be developed from the existing artificial reef. The design is guided by the natural design of the sea to determine ceramic stoneware body for coral growth. Design studies also influence the course of the study because of the ease to gather data before producing the study.

Our underwater world corals are found in oceans all over the earth. Some live in the shallow water [1]. Coral is the place for sea creatures to find food and shelter.

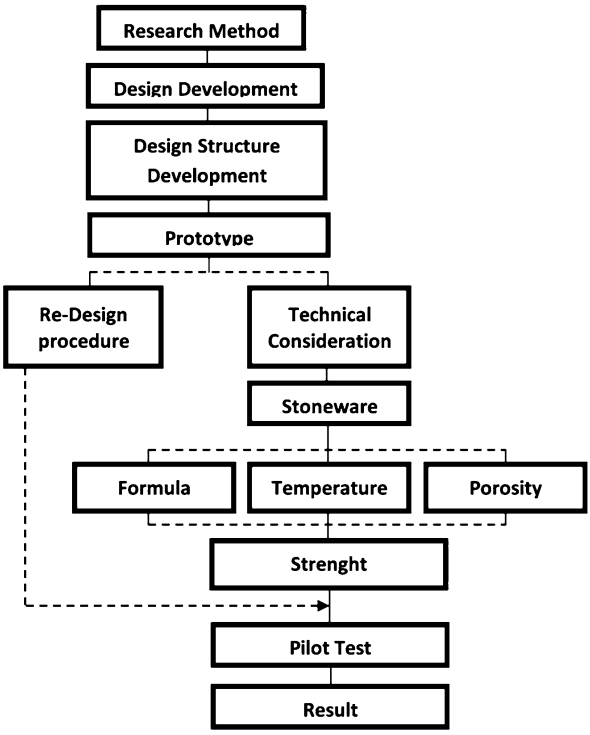

Fig. 16.1 Graph chart

Manufacturing Studies

Manufacturing studies aim to investigate the stoneware body such as the body formula, prototype and pilot test, and we will find that result after the design studies process.

Design Development

The developments aim to find the best artificial reef design for marine life. The design development also becomes an innovation of the new design to replace the old design. Design is created based on ease of marine life to find food and shelter and also the design suitable for marine life.

Design Structural Development

We also investigate the suitability of the structural design on the sea. This is because the design must have a strong structure to fight the waves and should provide a strong shelter for small fishes [12].

Prototype

A prototype is a design in 3D or structure design before finalizing the actual product and is produced in the lab for making the final product. Prototype also will be investigated by the redesign procedure and technical consideration.

Redesign Procedure

Redesign procedure is achieved when the final design structure is changed or developed to a new design. Redesigning is also to investigate the suitable placement of the artificial reef design.

Technical Consideration

The technicality of this design also is important to determine the size, location and installation. The technicality will be considered usually during the product making. We need to know about every design and structure to making and suitable size, location and installation production.

Stoneware

Researchers need to do research about stoneware material like its formulation, temperature and porosity. Stoneware clay is a one of the materials from the ceramic material group. Stoneware clay is easy to get and affordable. Stoneware clay is a conventional material used by industries to make ceramic products. By using stoneware clay, we can adjust its porosity (more or less) depending on the firing temperature. For this study, researchers make the stoneware clay from the local clay. This is due to the fact that local stoneware clay is different in other country because it depends on the chemical in the clay and temperature. Hence, a test needs to be done on the local clay.

Formula

The first formula based on stoneware was developed by mixing it with another ceramic material to get the best stoneware body. This is the best stoneware material for ceramic body [13].

Temperature

After we created some stoneware formula, we need to test some firing temperature to find the suitable strength of the stoneware body and to get more porosity in the stoneware body.

Porosity

Porosity will be tested in the lab to calculate the data for every stoneware formula. Porosity is important for increasing coral growth on the stoneware surface [13].

Strength

Researchers need the strength of the stoneware body [7] to replace artificial reefs because of its ability to withstand natural sea conditions.

Pilot Test

After we decided on the best design to be produced, the mock-up production design will be tested in the sea to calculate its data as it works for marine life.

Final Result

When all data are collected, we can make the actual product and size of the artificial reef we want to produce [14].

16.6 Summary

In this study, the researchers attempt to produce an artificial reef design using ceramic material from stoneware body. We have to make some formulation for stoneware body and redesigning of artificial reef. As the consequences, the finding could contribute as a submerged breakwater for the coastal. By the end of this task, the artificial reef project is constructed not just as a typical design but as one of the identity designs of Malaysia.

16.7 Conclusion

In this conclusion, ceramic body can be a replacement material for artificial reef. Using stoneware body, it is not limited to create the new design for the artificial reef. Ceramic also is the best material because it is long lasting. Stoneware bodies were famous for ceramic artist due to their ease to creating a variety of designs.

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Chapter 17
The Exploration Methods of Consistent Raku Firing Glaze Effect Framework

Adibah Ali, Abdul Rahim Jalil, Mohamad Rizal Salleh, and Rusmadiah Anwar

Abstract Raku refers to a low-temperature firing technique which originated from Japan and is admired internationally nowadays for its simple, spontaneous, yet decorative effects through the firing itself or its glaze composition. The problem statement would be from raku firing; it is somehow rather difficult to obtain an identical effect through the same firing along with the same glaze composition; hence, ceramic material tends to crack due to rapid heating and cooling of the fired ware. Furthermore, the after effects of raku firing are often towards a darker shade as brighter shades are infrequently obtained. One of the objectives of this research is to control all aspects of the firing beginning with the timing and ending with an evenly distributed circulation of heat. Another aspect is to overcome the crack defects for the ceramic material by obtaining a glaze composition that will produce a brighter shade effect from raku firing. In this work, a defect-free ceramic product with the identical glaze effect will be produced through a single raku firing.

Keywords Ceramic • Consistent • Effect • Firing • Raku • Unique

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17.1 Introduction

Raku was formed in the sixteenth century by Sen no Rikyu through three wealthy and influential tea schools which are Urasenke, Omotesenke and Mushanokoji Senke. It was said that he was the first patron and founder of the raku tradition [1].

Raku covers a wide range of meaning from culture to pottery; however, in this research, it focuses on raku firing technique. Historically, traditional raku products were formed by hand and some ceramic tools [1, 2]. The use of combustible material was discovered by Paul Soldner, a raku innovator who started practising raku after reading Bernard Leach's book on raku. It all spontaneously happened when he was transferring a pot outside the kiln and placed it into a combustible material which produced smoke [3, 4]. The smoke appeared due to the heat from the pot which consequently gave a change of colour to the glaze, and that was the reason how post-firing reduction began. Comparatively, American raku pottery is larger, bolder and eye-catching [5].

The objective of this research is to control the end effect of raku firing which would be a standardised glaze effect from raku firing guided specifically by following an identical firing pattern. The problem statement would be from raku firing itself; it is quite delicate to obtain the same effect through the same or different firing even with the same glaze composition.

This research stresses on the fact that raku firing is a more economic way in the sense that raku kiln can be modified or even built manually with recycled items as well as some basic tools. It is an appropriate and inexpensive minimal equipment, uses renewable energy resources and is adaptable and suitable for educational purposes [5]. That is why the postgraduate student researcher particularly chose to focus on this aspect of ceramic firing.

17.2 Literature Review

Raku Firing

From the researcher's experience of doing raku, the approach of splashing cold water directly after transferring the glazed fired product out of the raku kiln was taken following the Japanese raku style. A different approach which is distinctly Western was also practised by the researcher by applying combustible material to create smoke known as a post-firing reduction method [4].

In this experimentation, the researcher is trying to innovate the Westernised raku technique of reduction. The idea is to change the smoke application method to the product, hence the timing of reduction during the firing process. If a consistent glaze effect can be achieved from raku firing, it would be more economic.

The traditional raku is divided into two main categories which is red and black raku. The differences were determined by the type of clay used to produce the product red earthenware and stoneware. There were also four particular ceramic styles formed: relating to tea bowls and raku is the Black Seto, consisting of thick, iron black glaze applied to a cylindrical tea bowl form. Other than that was the

Yellow Seto which emerged from earlier Chinese-inspired technique. There is also Shino style which uses white feldspathic glaze applied to a thick but light-weight stoneware body which was famous for its motifs in underglazed red iron. Lastly would be the Oribe style in which the vessels were formed by throwing and drape mould technique, decorated with white slip and abstract underglazed iron design and then glazed with a combination of translucent and copper glaze [1].

Raku firing effect is hard to control because of the reduction process. The subtle effect obtained from a well-practised technique may appear crude and uncontrolled in raku or they might not appear. Reduction in raku firing would be reducing the amount of oxygen available for combustion. It can be done post-firing or during firing depending on the glaze and firing method.

Post-firing reduction was popular amongst the Westerners where the atmosphere of a fired pot is reduced directly after the pot is glaze fired [7]. The hot pot from the kiln is buried under a combustible material such as sawdust in a covered container which is suitable for the occasion.

The kiln that was used is different because we built our own raku kiln. One of the kilns used was a wood-fired raku kiln built from fireclay, sandy gravel and sawdust as shown as in Fig. 17.1.

From raku post-reduction firing, sawdust firing was created relating to application of smoke to the product similar to raku. This method is done for a nonglazed product or bisque-fired product, suitable for potters who dislike glazing and glazes. The exciting part about sawdust firing is the spontaneous effect that can be seen as pattern decorating the body [8].

Sawdust firing is a very relatively straightforward firing which does not require any refined equipment. The beauty comes from carbonisation in which carbon is produced during the combustion of fuel with insufficient air deposited in the surface of the product which will produce random black and grey effect suitable with the low firing temperature that the kiln can handle, which can also be applied through raku firing.

Fig. 17.1 Wood-fired raku kiln [8]

Sawdust and raku firing are often interpreted as the same process; however, they are not [8]. First of all, for sawdust firing, it is unglazed, and the firing starts cold and then gradually heated up by the sawdust which fuels the kiln. For raku firing, they are preheated, and it is glazed when it comes in contact with sawdust after glaze firing. Raku, a quick firing process, could be done in a short period of time approximately 20 min because of the fact that the kiln was preheated [9].

For this experiment, the combustible material would be applied during firing. It would be either rice husk or sawdust depending on the desired effect to the glazed body. The reduction part is the delicate process whereby the researcher will create a mechanism for the smoke to travel and moreover be distributed evenly into the kiln as compared to applying the combustible material directly in the kiln at certain positions or even applying the combustible material post-fired manually.

Figure 17.2 a, b shows a modern raku homemade kiln where it can stand a few firing due to its non-heavy-duty characteristics.

Raku firing is a kind of smoke firing where you have the options of post-firing or smoke firing during the process [6]. It should be experimented more to know its best possibility.

Through oxidation firing, a more reddish effect is obtained; however, grey and black shades are gained from reduction and moreover when it is carbonised [10]. In addition, oxidation as well as reduction is a chemical process often consciously evoked during firing by altering the amount of air that is burning the fuel. Relating to raku, which uses combustion material, it must have enough oxygen in order for it to be effective to keep the flame and the kiln free of smoke as possible [11]. Reduction firing happens when the air from the kiln is cut down and the draught from the kiln is reduced, and then a reducing atmosphere is produced. For gas kiln raku firing, the firing must be conducted with extreme care to balance air and fuel so as to achieve the correct atmosphere at the specific stage of firing.

The raku body needs to be porous enough for the heat to pass through with as much inert material as possible in relation to the clay content in order to prevent thermal shock in the raku process [12]. This solves the cracking problem during the firing process due to rapid heating and cooling. Any clay body can be made into raku body by opening it up with dirt, grog or sand wedged in a ratio of one third to two thirds of the body.

Fig. 17.2 (**a**) Modern raku kiln. (**b**) Lifting up the raku kiln to take out fired pieces (Oten Pottery, 2007)

Table 17.1 Clay body recipe

Low-fire porcelain body recipe	Low-fire stoneware body recipe	Earthenware body recipe
China clay 25 %	Fireclay 50 %	Common surface clay (Terra sigillata) and red art 30 %
Ball clay 25 %	Ball clay 20 %	Fireclay and gold art 30 %
Body frit/ground glass cullet 40 %	Cullet 25 %	Ball clay 30 %
Silica 10 %	Silica 5 %	Silica 10 %

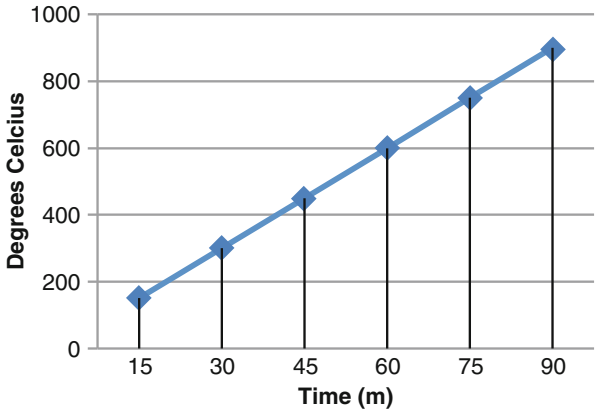

Fig. 17.3 Raku firing graph

There are also clay body recipes [13] at Table 17.1; however, the clay body which the researcher is attempting is stoneware or to be specific recycled stoneware or stoneware added with grog. Grog is prepared by using crushed bisque material or fine coarse sand [14]. Grog works as an additional material together with the clay body that will reduce shrinkage and assist with forming larger ceramic art pieces [12, 15].

Through those recipes shown in Table 17.1, it should be tested according to the intended temperature. If correct workability is not achieved, rearrange and modify the materials within the 100 % batch and try again.

A firing graph for the raku firing experimentation is shown in Fig. 17.3. Each raku firing takes 1 h and 30 min, and the firing temperature is set at 900 °C.

17.3 Methodology

For this research, the researcher will mainly do experimentation based on the literature review that has been studied. The researcher is attempting to better the raku firing process by achieving a standardised effect. Other than that, the researcher relies on scholarly articles to acquire information relating to this research [3]. The materials that will be experimented are stoneware, earthenware and porcelain; however, it will be minimised to only one material depending on which material has the most potential to resolve all the objectives of this research. The idea is to achieve a standardised effect from the firing itself including the reduction part of raku firing through a glaze composition that will be tested as well through this experimentation. Reduction is the part where it provides a different unique effect to each fired piece due to the method used to apply the combustible material [16]. Therefore, the researcher will create a mechanism separate from the kiln that will allow the smoke to be evenly distributed to the fired product during firing for reduction purposes. The raku firing timing and expected temperature reached for the experimentation which the researcher will pursue for each firing are shown in Fig. 17.3. The target of this firing is to reach 900 °C in 90 min time, in which for every 15 min the aim of temperature increase is 300 °C.

17.4 Expected Outcome

Through previous practices, raku is proven to be practical for practitioners; however, there are many difficult tasks in controlling the glaze effect due to its low possibility achieving a certain standard effect. It is also innovated by the Westerners to improve the quality of effect created through this firing. This research is anticipated in favour of accomplishing the proper method as well as creating a practical mechanism that would be able to assist with the raku firing reduction process.

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Chapter 18
Photo Exemplar Classification: The Integration of Photographic History into Photographic Technique

Iwan Zahar

Abstract The dispute has been long whether photographic lecturers should integrate the history of photography into a course on photography. The photographic lecturers should discuss photographic theory deeply, by introducing photographers such as Henri Cartier-Bresson, Cindy Sherman, Barbara Kruger, etc. to students. Most of the photographic lecturers were more interested in teaching photographic techniques than photographic theory. This paper used content analysis to classify or categorize modernist photography. Photos are evaluated using the Barrett's criticism model. This research used aesthetic exemplars in the form of modernist photography. Most of the students have few problems interpreting the works of modernist photographers compared to the works of postmodernist photographers. The students were unfamiliar with the subject matter, theme, and photo presentation; thus, they have difficulty interpreting postmodernist photos. Moreover, students were more interested in photographic techniques which were used by modernist photographers. The classification of photos will help lecturers to prepare for photographic courses especially for the beginners.

Keywords Classification • Photo history • Photo technique • Modernist • Photographer

18.1 Introduction

We might say that photography is unclassifiable [1]. The statement of Roland Barthes might not be appropriate if we talk about how to prepare learning materials within a frame of photo categories or photo classification. Many photographers or art educators for a long time have tried to classify or made photo categories. The history of photograph includes pictorialism, impressionist, straight

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movement, etc., an example being that art historian tries to classify photographers based on their photographic styles. Usually in photo competition, photos are categorized or classified into several the subject matters which are portraits, landscapes, nudes, etc. Why do we need a new photo classification or a new category? However, Terry Barrett visited a college and found that most of the students had completed Photography I and II but had not heard or seen the works of Henri Cartier-Bresson, John Coplans, etc. The students' instructors ignored recent photographic history and concentrate solely on teaching photographic technique. The photographic history certainly explained practice of what images are made, written and talked about, shown, collected and preserved, and taught [2]. If we have to introduce all fine arts photographers or all highly aesthetic photos, the subject matter will not be the focus by the students who took Photography I and II. Usually the beginner students are more interested in photography technique and photographic medium. Most of the students easily relate with modernist photographers compared to postmodernist photographers. The students were unfamiliar with the subject matter, theme, and photo presentation; thus, they have difficulty interpreting postmodernist photos. Moreover, students were more interested in photographic techniques which were used by modernist photographers. They are not interested in knowing the concept of making photographs, postmodernist photographers, and photographers' styles. In other words, beginner students can appreciate the works of Ansel Adams or many other modernist photographers. The beginner students are usually not interested in Cindy Sherman, Joel-Peter Witkin, or many other postmodernist photographers. According to Kohler [3], these postmodernist photographers use photo techniques such as all exposure techniques and all manipulation of negatives and prints, which allow to demonstrate technical dilettantism, which are outside Photography I and II. However, modernist photographers render things objectively as they find them, i.e., clearly and sharply and true to both form and detail. Modernist photographers do not also allow manipulating their exposed negative in the darkroom, and their prints should be in the highest technical perfections and contain a rich range of gray tones. All "graphic" or "painterly" effects diminish the realistic quality of the photograph and are therefore to be avoided. For modernist photographers, the camera artist should find his/her subject and not invent. These methods are suitable with beginner students and within the range of Photography I and II [4].

What is the right strategy to deliver photographic materials which combine photographic techniques with history of photography? I proposed a classification based on the techniques of photography within the range of Photography I and II. The curriculum for Photography I is about how to use the camera and film, its basic composition, and how to take better pictures indoor and outdoor, and Photography II is about basic studio photographs. However, the classification tries to relate the techniques of photography and the photographers whose work has already been considered as high-standard fine arts. The darkroom process is not included in the photo classification, and there will be another classification according to darkroom techniques. This discussion is not included in this paper.

18.2 Methods

Unlike researchers who employ other empirical techniques, content analysts examine data, printed matter, images, or sounds – texts – in order to understand what they mean to people, what they enable or prevent, and what the information conveyed by them does [5, 6]. The research is using content analysis and follows some steps. In step one, I chose exemplary photos of art from nearly 77 modernist photographers from various sources such as books, dissertation, and the Internet. In step two, I classified the photographers' work with respect to Barrett's photo criticism model. Barrett's criticism models will be divided into three steps: description, interpretation, and judgment. Description is to describe a photograph, or an exhibition is to notice things about it and to tell another, out loud or in print, what one notices. Descriptive information includes statements about the photograph's subject matter, medium, and form and about the photograph's causal environment including information about the photographer who made it, the times during which it was made, and the social milieu form which it emerged. This research will not discuss postmodernist photographers or contemporary photographers.

Interpretation is to interpret an image or photographs to make sense of it. To interpret is to see something as representing something or expressing something or being about something. Evaluation is different from interpretation. Interpretations are statements about the meaning of an artwork, whereas judgments are statements about the worth or value of the image. When critics do judge photographs, they usually praise them and sometimes fault them [2]. In other words, judge is the action when the learner decides what type of art is being examined by comparing it to the theories of art. In this research, I emphasized more on description and photo techniques. The classification is not based on the meaning of the pictures but on photo techniques. All of the results are shown in Table 18.1.

18.3 Results and Discussion

The Photo Classification Based on Photo Techniques

Camera Types

SLR 35 mm. Usually photographers use many different types of camera, but Henri Cartier-Bresson preferred SLR 35 mm types of camera and most of his famous pictures are printed in black and white. Medium-format cameras. Marilyn Bridges uses medium format to take archeology artifact, landscape, and cityscapes from airplane. Large-format cameras. Many photographers at the beginning of the twentieth century, for example, Ansel Adams and Yousuf Karsh, employed large-format cameras and tried to use smaller cameras in their later carrier. Aperture. Small. Actually there are no living photographers who used only the smallest possible aperture nowadays, except Group f.64 (Ansel Adams, etc.). They used the smallest aperture to

Table 18.1 The modernist photographers, techniques, description, and type of film

Photo exemplars by modernist photographers	The techniques of photography	Description	Types of film
Henri Cartier-Bresson, Robert Frank	Camera types	SLR 35 mm	Black and white
Marilyn Bridges		Medium format	*Black and white*
Ansel Adams, Yousuf Karsh		Large format	Black and white
Edward Weston, Brett Weston, Ansel Adams	Aperture	Small	Black and white
Henri Cartier-Bresson		Medium	Black and white
Eugene Smith		Large	Black and white
Fritz Goro	Lens	Microphotography	Color
Ernst Haas		Macro	Color
Ikkō Narahara		Fisheye	Black and white
Bill Brandt		Wide	Black and white
Henri Cartier-Bresson, Helmut Newton		Normal	Black and white, color
Franco Fontana		Tele	Color
Arnold Newman, Eric Staller, John Starr, Francisco Hidalgo	Shutter speeds	Slow	Black and white
Henri Cartier-Bresson		Medium	Black and white
Eadweard Muybridge		Fast	Black and white
Arthur Weegee	Flash	Direct	Black and white
Annie Leibovitz, Arnold Newman, Andy Earl		Mixed	Black and white, color
Yousuf Karsh, Philippe Halsman		Studio flash	Black and white, color
Ernst Haas	ASA	Slow	Color
Bill Brandt, Sebastiao Salgado, Merry Alpern		High	Black and white

Merry Alpern, Bill Brandt, Alex Majoli	Lighting	Contrast	Black and white
Pete Turner			Color
W. Eugene Smith, Sebastiao Salgado, Alex Majoli, Trent Parke		Low key	Black and white
Ernst Haas, Jonas Bendiksen			Color
Richard Avedon, Irving Penn, Mario Giacomelli		High key	Black and white
Peter Marlow			Color
W. Eugene Smith, Roy DeCarava		Back and rim lighting	Black and white
Ernst Haas			Color
Marilyn Bridge	Depth and distances	Viewpoint (top)	Black and white
Garry Winogrand		View point (tilt)	Black and white
Elliott Erwitt		False attachments	Black and white
Stieglitz, Alvin Langdon Coburn, Edward Steichen, Paul Strand, Laszlo Moholy-Nagy, Alexander Rodchenko		Unusual vantage point, close-up	Black and white
Franco Fontana		Distance view point	Color
Ansel Adams, Henri Cartier-Bresson, Bruce Gilden, Burt Glinn, Erich Lessing		Depth through scale changes	Black and white
David Alan Harvey			Color
Ernst Haas	Timing and movement	Panning	Color
Henri Cartier-Bresson, Robert Capa		Critical movement	Black and white
Eadweard Muybridge, Duane Michals, Roman Vishniac		Picture sequences and time-lapse photography	Black and white
Elliott Erwitt, Robert Doisneau, Rene Burri, Chien-Chi Chang, Josef Koudelka	Juxtaposition	Juxtaposition	Black and white

(continued)

Table 18.1 (continued)

Photo exemplars by modernist photographers	The techniques of photography	Description	Types of film
Harry Callahan, Brett Weston	Subject elements	Line	Black and white
Brett Weston		Shape	Black and white
Micha Bar Am, Werner Bischof, Nikos Economopoulos, Ralph Gibson		Pattern	Black and white
Ernst Haas, Stuart Franklin			Color
Mario Giacomelli, Brett Weston		Texture	Black and white
Edward Weston, Robert Mapplethorpe, Ansel Adams, Eikoh Hosoe		Form	Black and white
Pete Turner, Constantine Manos	Color	Primary color	Color
Harry Callahan		Pastel	Color
Peter Marlow, Martin Parr		White	Color
Henri Cartier-Bresson, Arnold Newman	Basic composition	Geometric background	Black and white
Andre Kertẽsz, Paul Strand, Albert Renger-Patzsch, Ladislav Berka		Geometric design	Black and white
Paul Strand, Albert Renger-Patzsch, Lee Friedlander, Lynn Davis		Middle	Black and white
Lee Friedlander, Raghubir Singh		Framing	Black and white
Ansel Adams, Albert Renger-Patzsch		Rule of thirds, placing the horizon	Black and white

render object details as real as possible. Group f.64 was the pioneer of straight photography. Medium. Photographers are trained to use f/5.6 or 8 if they took portraits or human pictures. It is possible that many of Henri Cartier-Bresson's pictures used medium apertures that showed details in the background. Large. There were also no photographers that use large aperture all the time; Of mention will be W. Eugene Smith's pictures in Minamata entitled Bunzo Hayashida, a victim of the Minamata disease, 1971.

Lens

Normal lens. Only few photographers used normal lens in most of their work. The normal lens gives a viewpoint that is very close to the old paintings by Rembrandt van Rijn, Vermeer, etc. The exception with Henri Cartier-Bresson who wanted to be a painter in his early carrier and chose to use normal lens for most of his work. Tele lens. Usually many photographers change lens when they took pictures, with the exception of Franco Fontana. In one of his personal projects, he made his own photo project by taking only with telephoto lens. Sometimes, he used long telephoto lens, and many of his pictures conceal reality by their unfamiliar flattening of perspectives, their overall sharpness, and their lack of scale references. He took cityscape and landscape. Wide-angle lens. Bill Brandt used ultrawide angles when he took his famous nude series. His nude proportions became distortion. Fisheye lens. In extreme cases, Ikko Narahara's work often depicted isolated communities and extreme conditions with his hemispherical-coverage ("circular") fisheye lenses. Macro lens. Ernst Haas's personal project of the creation of the world showed many close-up pictures with macro lens. However, some photographers make the subject matter become much bigger to show the details. One of them is Fritz Goro who invented macro photography, making visible the world that lies between the microscope and the naked eye. Micro lens. Microphotographs of Roman Vishniac and Fritz Goro showed views taken through telescopes and airborne vehicles.

Shutter Speeds

Fast shutter speeds. Eadweard Muybridge used two or three banks of 12 cameras each and achieved individual exposures of nearly 1/2000 of a second to record sequential images of human and animal subject [7]. In contrast, Arnold Newman preferred to use slow shutter speeds and sometimes coupled with flash to take his portrait pictures. He liked to show the background of his sitter using slow speeds to record available light in his indoor portrait. Medium speeds. Other photographers, like Henri Cartier-Bresson, used possible medium speed to record human movement and gestures. Slow speeds. For colored pictures, Ernst Haas used slow ASA film that enabled him to take slow-speed pictures. John Starr used slow speed to take dance as a subject especially classical ballet. Starr portrayed the movement of the dance through the dynamism of his pictures. Often, the dancers were partially

obscured by blur effects, which were used to give an impression of the constant movement of forms. Nearly in the lowest shutter speed, Eric Staller used "light drawing" to create dynamic images, and he selected real-street scenes at night which he transformed into settings for light trails. They were done by extremely long exposures, sometimes as long as 20 min. During which time sparkled attached to posts of frames. He was dressed in dark clothing, and kept moving throughout the exposure, no trace of him or the light supports were recorded [8].

Flash

Direct. The most interesting photographer who used direct flash was Arthur Weegee. He worked full time in the police department in New York; consequently, he was always among the first on the crime scene – whether it was gangland execution, a fire, or a suicide. Weegee existed almost entirely at night, in pictures frontally lit with a flash on the camera. Mixed light. Further flash technique, Annie Leibovitz and Arnold Newman were photographers who often used mixed light indoor. They used flash-light and combined it with available light for their portrait photos. Andy Earl used sharpness and blur together in the sample photograph to express his interest in form, movement, and color. His technique was to shoot in weak daylight, using electronic flash and a short time exposure while moving his handheld camera. Studio flash. However, the most influential studio photographer was Yousuf Karsh. His lighting techniques were copied by studio photographers all over the world. His lighting technique used several harsh light sources to produce rich textures. ASA. Slow ASA film produces rich and saturated color; Ernst Haas often used slow ASA film to take his landscape and animal pictures. The color of his subject matter became more saturated when he took pictures with polarizing filter especially after rainy and cloudy days. Merry Alpern used telephoto lens to record prostitution behind the windows. She used high ASA film and push process in darkrooms. Her pictures were high grains but interesting to look at. By way of voyeurism, Nobuyoshi Araki took couples who were making love in the garden; however, Araki did not use high ASA film. Another photographer who used high grains was Bill Brandt, a British photographer who used a lot of high ASA films to take his famous distorted nude series.

Lighting. Lighting contrast is the difference between the amount of illumination reaching the brightest and darkest part of a scene. Bill Brandt, Alex Majoli, and Merry Alpern used lighting contrast. Alex Majoli used hard lighting on the person with a dark background, so the pictures become contrasted. With similar technique, W. Eugene Smith took many of his famous pictures in Minamata, Japan. Nearly most of W. Eugene Smith's pictures in Minamata had the tones that came from the dark end of the scale – known as "low key." His photograph Tomoko Uemura in Her Bath using high-contrast lighting from window which showed a woman cradling her dying son is one of the best low-key effects. These low-key pictures could be resembled with Rembrandt's or Caravaggio's paintings. Sharing similar technique, Roy DeCarava took many low-key pictures. In contrast, Richard Avedon took portraits with white background so that the picture consisted mainly of pale tones known as "high key." Peter Marlow took many cityscapes with color photography.

His pictures showed many big areas in white, cloudy, or other pale colors. These high-key photographs could be compared with the way the impressionist painters used colors. The use of many white or other pale colors by Peter Marlow in photography reminded the way Pierre-Augusto Renoir used white color in most of his paintings. Not many photographers took back and rim light, but Ernst Haas, Andy Earl, and W. Eugene Smith produced some of their best work with this technique.

Depth and distances. There were not many photographers who explored their art from above. As such is Marilyn Bridges who preferred to shoot archeological sites and contemporary landscape filled with the evidence of industrialization from above. She preferred to take pictures in the morning and late afternoon when the sun creates long shadows. These shadows enhance three dimensionalities of what lies below and their pattern integrated as defining elements in her photographs. From the above, most of her pictures became a pattern and tended to be abstract. In other unusual viewpoint, Garry Winogrand took pedestrians and many urban lives with tilt viewpoints. The composition became unusual because the relations within the subject matter could be diagonal. Most of his subjects were in short distances. In the 1920s, Alfred Stieglitz, Alvin Langdon Coburn, Edward Steichen, Paul Strand, Laszlo Moholy-Nagy, Alexander Rodchenko, etc. took close-up pictures and pictures with unusual vantage points. Franco Fontana most frequently used distant viewpoint and telephoto lenses to turn the folds in a landscape into bands of color. He showed what camera saw but not through close-up. Ansel Adams showed distances and depth with normal lens or short telephoto lens. His black and white photos showed perspective and still normal view. David Alan Harvey also showed depth and perspective by comparing the subject matter in the foreground and background. Both photographers considered the scale of changes and normal proportion.

Timing and Movement

Panning. Ernst Haas had devoted much of his time to make photo-essays in color for books and illustrated magazines. His early use of slow-speed Kodachrome film had caused him image movement problems, because of the exposure time necessary. Gradually, he discovered the possibilities of using movement blur intentionally. Panning was one of his techniques to convey a dynamic sense of actions. Critical moment. Critical moment can influence pictures' structure as well as its content. A photographer may have to wait until a person walked along a distant, winding road is in exactly the right position within a landscape to balance the picture. Henri Cartier-Bresson's famous picture of a man leaping over a puddle was taken at precisely the right instant. A second sooner or later, the impact of pictures would have been completely different. Other well-known critical moment was when Yousuf Karsh snatched Winston Churchill' cigar from his mouth just before firing the shutter. The resulting picture was considered remarkable for its personality. Picture sequences. Duane Michals specializes in making picture sequences that tell a story. As this example showed, his images often involved strange or mystical events. His pictures were carefully staged and made use of the special image qualities of photography, such as blur, manipulation of tonal values, and change of scale, to create

disturbing images. Roman Vishniac was a pioneer of time-lapse photography in scientific photography. Juxtaposition. Robert Doisneau had based many of his pictures on relating formal statues to people and things. He had been capturing aspects of Parisian life for thirty years. He always succeeded in capturing the smallest incident and the juxtaposition of two incongruous objects. Elliott Erwitt also took many juxtaposition photos and sometimes was absurd. Josef Koudelka made a lot of juxtaposition photos of persons, animals, and other objects. But the juxtaposition between a person in Chien-Chi Chang photographs provided alienation and connection of feelings.

Subject Elements

Line. Harry Callahan studied line as subject by taking grass, weeds, trees, telephone wires, buildings, horizontal lines in seascapes, etc. as his personal project. Although Ansel Adams's work had a lot of lines inside his pictures, he was not taking lines as his subject. His lines appeared as branches of trees, train rails, water ripples, and dunes. Shape. Brett Weston, son of Edward Weston, had employed lines and shapes to make striking abstracts, completely free from manipulations. Pattern. Ralph Gibson used the extreme detail and realism of photography in a highly personal way. Surfaces, clothing, and parts of buildings became patterns because he took it up close. Micha Bar Am, Werner Bischof, and Nikos Economopoulos used many patterns in their work. Ernst Haas took many patterns of his landscape and nature photos with his close-up lens. Stuart Franklin employed pattern of objects as his subject matter as well as his backgrounds. Texture. Although his landscape pictures were not as well known as his Young Priest series, Giacomelli developed a more abstract style in which, through the magic of framing using high-angle shots, landscapes became both depictions of land use in Italy and actual photographic "paintings," no less, with abstract signs. His abstract signs showed a lot of textures. Shooting with close-up techniques, Brett Weston showed many textures in his abstract photos or his landscape photos. Form. Edward Weston and Robert Mapplethorpe showed similarities in their subject matter. Both photographers showed form of nudes and flowers. Eikoh Hosoe, a Japanese photographer, showed interesting forms of the female nude bodies with close-up viewpoints and most of his pictures became abstract.

Color

Primary color. Pete Turner has continued to search for unique relationships between graphic design and bold color. He used many primary colors. Other younger generation used color photograph such as Constantine Manos who used red, yellow, blue, and cyan in his subject matters. Pastel color. In contrast, Harry Callahan explored his new "color" for ten years. His subject and subject matter are not different with his black and white photographs. The only difference is that he also took many pedestrians in Mexico, Egypt, Ireland, etc. He mostly used pastel colors. White color.

Martin Parr started to use color in 1982, and he did not intentionally used white or pastel colors for most of his subject matters. He took photos of people wearing white shirts, white chairs, white buildings, etc. in Britain. Sharing similar color with Martin Parr, Peter Marlow used white subject matter in his compositions.

Basic Composition

Geometric background. Both photographers, Arnold Newman and Henri Cartier-Bresson, used many graphic elements in their background photos. Nearly all works of Henri Cartier-Bresson and Arnold Newman had people as their main subject with geometric backdrops such as building, windows frames, railways, shadows, etc. Portrait of Igor Stravinsky was one of Arnold Newman's best works that shows geometric composition. It would be interesting for students to compare and contrast both photographers. Geometric design. Before the Henri Cartier-Bresson era, Andre Kertẽsz, Paul Strand, Albert Renger-Patzsch, Ladislav Berka, or the 1920s photographers made geometric design of flowers, buildings, machines, and household objects as their subject. Middle. Most of the 1920s photographers who used large-format cameras tend to place their subject in the middle of the compositions. Paul Strand took many of his portraits in the middle of his frames. Also Albert Renger-Patzsch, a German photographer, explored the possibilities for using natural and man-made subject as subject matter. Most of their subject matters were placed in the middle. Many of Lee Friedlander's main subject matters were placed in the middle including his famous work, American Monument. Lyn Davis used middle compositions as can be seen in many of his photographs of landscapes and ancient buildings. Rule of thirds. Landscape photographers were usually concerned with horizontal lines in their pictures. Ansel Adams's work showed various positions of horizontal lines in his landscape pictures. For teaching purposes, Ansel Adams's landscape photos should be compared and contrasted with Edward Weston and Albert Renger-Patzsch's works. Framing. One of the most popular discussions on how to take better picture was framing techniques. Lee Friedlander applied the side view mirror, rearview mirror, the windshield, and the side windows as picture frame. This method allowed for fascinating effects in foreshortening and wonderfully telling juxtapositions in which steering wheels, dashboards, and leatherette bump are up against roadside bars, motels, churches, monuments, suspension bridges, landscapes, and often Friedlander's own image, via side view mirror shots. Raghubir Singh in his book the *Grand Trunk Road* used framing techniques but not as much as Lee Friedlander. All standard paper components have been specified for three reasons: (1) ease of use when formatting individual papers, (2) automatic compliance to electronic requirements that facilitate the concurrent or later production of electronic products, and (3) conformity of style throughout conference proceedings. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this document and are identified in italic type, within parentheses, following the example. Some components, such as multileveled equations, graphics, and tables, are not prescribed, although various table text styles

are provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

Special notes must be considered using the classifications as given below.

- The classification actually differentiates photographs which were made with the same or similar photo technique. It will be difficult to write all the titles of the photographs and classify them. It will be easier to use this classification if we select photographers who use specific photo techniques.
- The classification is not intended to differentiate modernist and postmodernist photographers. Although most of the photographers in the classification are modernist photographers, some photographers such as Martin Parr, Ian Berry, and Constantine Manos are contemporary photographers who took pictures during the postmodernist era.

18.4 Conclusion

The photo classification based on photo techniques helps photography teachers in the preparation of materials and delivery especially for Photography I and II. The integration of theory in the beginning of the course will help students to relate between history of photographs and photo techniques. Students do not only learn the photo techniques, but they also learn the way photographers approach the subject and the method to develop their themes. The classification shows us that many photographers develop photo techniques to achieve their photographic styles.

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Chapter 19
Construction of Design: A Formal Proposition of Graphics Analysis of Comics

Karna Mustaqim and Muliyadi Mahamood

Abstract Comics is a hybrid between two modalities which intertwined the textual and the visual; the term 'analysing' in the above title is best understood as 'visual reading' of the comics. Reading comics involves an active subconscious partaking of the reader. We take for granted that by reading the sequences of the picture's story, we already imagine what really happened in between the panels in our mind. The purpose of visually analysing the four local magazine's contents is to thoroughly discover the appearance of the comics content that includes types and features of the comics, grids and layout design, but not to gain a few of qualitative categories by using statistical quantifying. The understanding of the characteristics of each magazine cannot be fully comprehended by separating parts of the magazine's contents but through the analysis in its visual component. It is to recognize the comics' visual element in order to provide a proposition of formalistic aspects of the comics graphic art and design.

Keywords Graphics • Design • Visual • Grid • Formalistic

19.1 Introduction

Roger Sabin [4] emphasized that 'the interplay between the written and visual is a complicated process; a comic does not happen in the words, or the pictures, but somewhere in-between, in what sometimes known as the marriage of text and image' (as cited in Versaci [5], p. 14). The uniqueness of reading comics is its two

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modalities—(1) the texts and (2) the images—which disclosed a distinctive way of visual reading. Rocco Versaci [5] implies that:

> Comics can be read straight away from panel to panel, but since the texts and the images in comics appears simultaneously together, it is possible for comic creators to play with the design of a page by manipulating the visuals within panels and the panels themselves within the page to create additional layers of meaning. (p. 15–17)

People read for a variety of needs and desires, and sometimes several of these reasons operate at the same time: to be informed, entertained, instructed, challenged, or transported. The researcher will concern briefly on one of those motivations—to be transported—because it is often associated with a certain kind of reading that is usually not held in high regard: escapism. Mostly, 'escapism' is associated with the most 'pop' of our culture: the entertainment that is designed for mass appeal and minimal thinking. Carl Barks as the artist behind Donald Duck once in a while stops by and consciously asks about his own practice of cartooning, 'What did I imagine my characters were doing between the panels? For the first time I realize how deep and complex, the creating of comic book stories really is' (as cited in Ault, 2000, p. 123). To visually analyse the magazine thoroughly is to discover and be involved with the world of comics. Comics magazines have their own characteristics which differentiate one from the other. In this paper, researcher limits the analyses on the formal aspects, since it is the visual appearance that first tempts a reader and transports him or her into the story world of comics.

19.2 Types of Comics Magazines in Malaysia's Publication

General Types of Comics

According to Hamedi Mohd Adnan [2] in *Penerbitan Majalah di Malaysia: Isu-isu dan Cabaran* (*Magazines Publication in Malaysia: Issues and Challenges*), after the publication of *Gila-Gila* on the first of April 1978, there was a large amount of comics (humour) magazines that appear in the market, including the adaptation or simply republished and translated Malay's version. Since the beginning, it seems there has been a slightly different association between the comics and cartoon, although it was not clearly identified in two chapters, seven and eight, of the book. As said by Hamedi, 'Malahan keluaran awal Gila-Gila masih terikat dengan konsep komik walaupun sedikit demi sedikit, unsur komik itu didominasi kartun dalam erti kata yang sebenarnya' (p. 144).

This study did not depend on historical literature to find out what was meant by comics and cartoon in the past, but as we thoroughly read current comics magazines, there were simply non-essential difference between them. Most publications of comics magazines were highly inspired by the successfulness of *Gila-Gila*, and humorous content with the cartoon drawings became the main exploration in their visual languages. Later on in the mid of 1998, a new brand comics magazine was

published under the name of *Gempak*, a magazine that is heavily influenced by contemporary popular culture, especially games, movies, animation and comics from Japan [3], Korea and also the United States. For the purpose of the study, we put comics magazines into two types, humour magazines and comics magazines, but used the 'comics' term in general.

Humour Magazine

In the recent publication, majority of comics magazines published in Malaysia have humour as a theme. It obviously appears in their cover design features. In this study, the covers of *Gila-Gila*, *Ujang* and *G3* show a general illustration of humorists' events. Some examples here will be discussed slightly.

From the previews of these four covers, we can clearly see that *Gila-Gila*, *Ujang* and *G3* proposed a humoristic illustration of the Hari Merdeka (Independence Day) events. These three magazines were using visual narrative in their cover illustration, which is not the approach used by *Gempak*.

The *Gila-Gila* magazine illustration played a role in issuing the social critics issue; as we can see it in the example above, illustrating the motorcyclists' driving manner in celebrating the Malaysia Independence Day, polices (the authority) were checking on one of the motorcycles (Fig. 19.1).

Ujang puts their so-called *Bumper Merdeka* edition illustrating the celebration of Independence Day event; it shows three cartoon *characters* in a car fully decorated with the nation's flag (Fig. 19.2). *G3* uses caricatured drawing of famous celebrities' gossip, which is indirectly illustrating the celebration of Independence Day figuring a woman holding a man (Figs. 19.3 and 19.4).

Comics Magazine

Gempak and *G3* were considered as a comics magazine rather than magazine with humorous contents. This separation is probably non-essential if we look through all the magazine contents that *do* not strictly provide definitive differentiation between cartoons and comics stylization. Some other comics publication cover illustrations or designs can be shown here as to see somewhat different approaches from the humorous magazine (Figs. 19.5 and 19.6).

Blues Selamanya was published by MOY Publication; it was one of the quite distinctive comics magazines that dare to label their comics as so-called Majalah Novel or usually known as graphic novel which refers to a more matured comics medium. It has a banner that said *Keunggulan Sebuah Majalah Novel* (*The Preeminence of A Novel Magazine*) which means this magazine was a magazine with more content on novel stories, although there are many comics pages inside, but still the comics also present dramatic stories appropriating the novel kind of

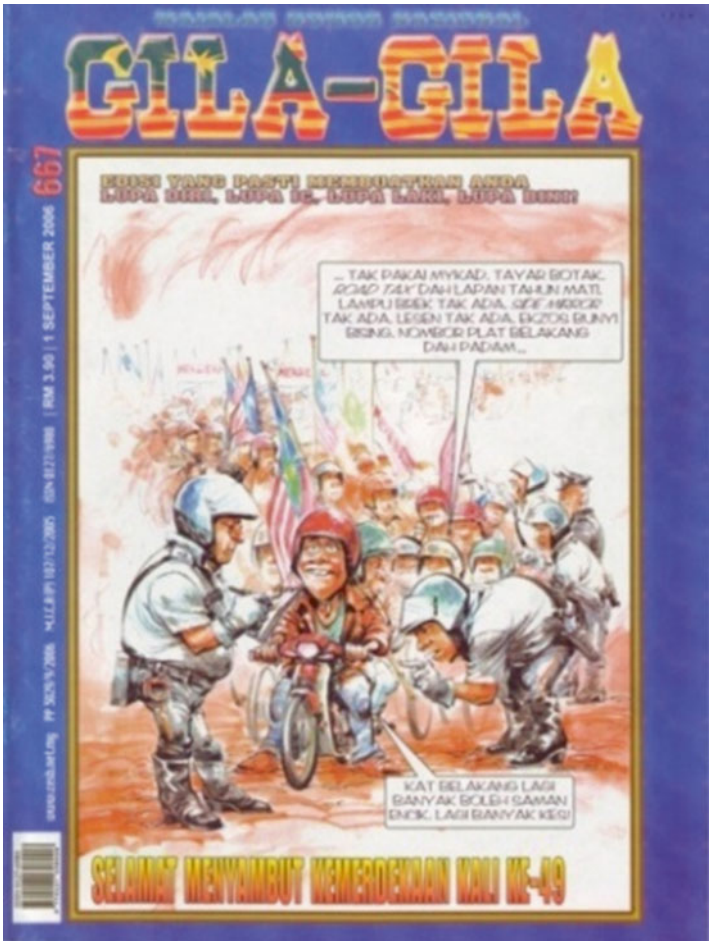

Fig. 19.1 *Gila-Gila* No. 667, 01 September 2006

storytelling style. In spite of its creative treatment of the form and content of comics, both magazines *Urban Comics* and *Blues Selamanya* were unsuccessful in competing in the market.

19.3 The Visual Characteristics

The contents of comics magazine have somewhat similar, if we read thoroughly; there are four main categories: (1) comics, (2) articles, (3) stories and (4) others. **First** and foremost, there will be some generic features on comics such as single

Fig. 19.2 *Ujang* No. 291, 01 September 2006

panels or illustrated opinion *comics*; strips comics, single page or spread pages; short story comics in multiple pages; and ongoing serialize comics. **Second**, it also provides articles that feature information about artist profiles, local and international comics artist and illustrator, and also feature articles on information entertainment (infotainment), about product review including gadgets, computers, games, animation and movies. **Third**, although its main features are comics, they also have a short story with the theme around youth, love and life dramas. We may say that the content of a comics magazine contains not only comics but also some other popular cultures. **Fourth**, some magazine such as *Ujang* routinely featured special bumper

Fig. 19.3 Gempak No. 163, 01 September 2006

for special events, be it the Independence Day celebration or any other local or international celebration. Others also included song's lyrics, puzzle or riddle games, posters or bonus gifts. The researcher develops the categories using the G3 and *Ujang* magazine collection because it seems to bridge the table of contents between the humour magazine such as *Gila-Gila* which has long been established and the most current comics magazine such as *Gempak*. Here we use the term collection rather than sample to show that it is not for the purpose of validating any objectives but to gain rich features on the comics. Below is the categorization which came up from reading and analysing the magazine contents.

Fig. 19.4 G3 No. 31, September 2006

The Comics Features

We show here some examples of the variation of comics features found in *Gila-Gila*, *Ujang*, *G3* and *Gempak*. **First**, it would be a single panel comics, which is commonly known as illustrated opinion. *Gila-Gila* invariably design their cover using this type of comics features to express the social criticism (Fig. 19.7). *Ujang* also used it, but not necessarily in terms of social critics, inasmuch as the cover is commonly designed only for the sake of jokes or stirring a kind of situated comedies.

Fig. 19.5 *Blues Selamanya* isu.128, 01 September 2006

Second, here we can see some other unique features of comics strips that come in a single page or spread pages. The humour and social critics, or humoristic content, can be said as primary features of *Gila-Gila* magazine (Fig. 19.8). *Ujang* also features the humoristic content using one-page format, but the joke is more lighthearted with an attempt to be just funny. Many of its cartoonists used unique nickname and have their own comics title and page(s) (Fig. 19.10).

Thoroughly reading the comics collection, researcher makes certain categorization that can be used as a generative table of the comics contents of its formal features. There would be (1) title; (2) author, which can be divided into a writer, the

Fig. 19.6 *Urban Comics* No.15, September 2002

artist who did the drawing and inking and colourist; (3) amount of pages or series; (4) genre; (5) topic; (6) character; (7) scene; (8) media and technique; and (9) drawing style. An example of this is *Ujang* by Papan (Figs. 19.9 and 19.10).

It is written and also painted by the cartoonist named Papan as we can see it underneath its title *Ujang: Penulis/Pelukis*, *Papan. Ujang* means foolish humour; it has indirect meaning; if translated formally, *Lawak* means humour, comics and funny; and *Dodol* is a kind of jelly sweet and sticky snack made traditionally by rice flour and coconut milk, originating in Nusantara archipelago. *Dodol* has a negative connotation which means foolish.

Fig. 19.7 *Gila-Gila* No. 675, May 2007

The '*Lawak Dodol*' itself is a general title found in Ujang magazine, amongst other title would be found as *Lawak Antarabangsa (International Humour)*. Its cartoonist, Papan, has several various titles in *Ujang*, which uses his specific character *Lembu*, a fat funny cow who *can* talk to the people of its village. Its comics usually took place in a kampong (Malay village). His comics usually appears in short form, one single page or two pages. *Lawak Dodol* appears in only one page.

Another work by Papan using his drawing style and characters appears in collaboration with another artist named Azs, who did its graphic arts. The title is *Lembuku yang Baik* (*My Good Oxen*) (Fig. 19.11). It comes in two-page format. The cow in *Lawak Dodol* performed as a robber, and in *Lembuku yang Baik*, it acted as human who can sing and get angry. But, especially, the villagers always called the cow using an honourable title such as *Yang Mulia* (Your Honour) and *Beliau* (Yours).

Fig. 19.8 *Ujang*, No. 298, 15 December 2006

19.4 Analyses of the Visual Design

Researcher found that the visual design could be generalized into three parties**: First,** it is about how the panel's design appears with rigid composition and dynamic and more expressive forms. **Second**, the page layout design usually comes in a single strip, single page strips, double page strips and multipage strips. **Third**, we can see creativity in designing its caption, speech balloon, visual symbols, sound symbols and visual effects (Table 19.1).

Fig. 19.9 *Drama Tanpa Suara: Komplot Curi Gula* by Azs, *Gila-Gila*, No. 667, 01 September 2006

Grid Design and Layouts

A rigid design and layout composition of panels usually appears in shape of rectangular strips (Fig. 19.12). The panels play sequence of the visual storytelling. According to Gary Spencer Millidge [1] in 'Comic Book Design', 'the best comics usually have simple, easy to follow layouts' (p. 38), which means that this following example of comics panel grid was designed to catch readers' eyes with simple layout, so its visual tells the story without any interruption.

Fig. 19.10 *Lawak Dodol*, by Papan. *Ujang*, No.318, 15 October 2007, p. 115

Millidge further mentioned that some skilful comics artists may have a lot of experience to elaborate complex pages or panel design without having to confuse or alienate the reader or lost the thrust of the story. He explained the need to choose of the panel borders and gutters, which is indeed very much related to the drawing style of an artist's artwork.

> …with the ever-increasing variety of styles of comics and illustration and design, and the huge advances in computer design software, many more options are now available for the comic book creator. Freehand styles, curved corners, white borders, no gutters, and even no borders at all are amongst the choices for the imaginative artist. ([1], p. 42)

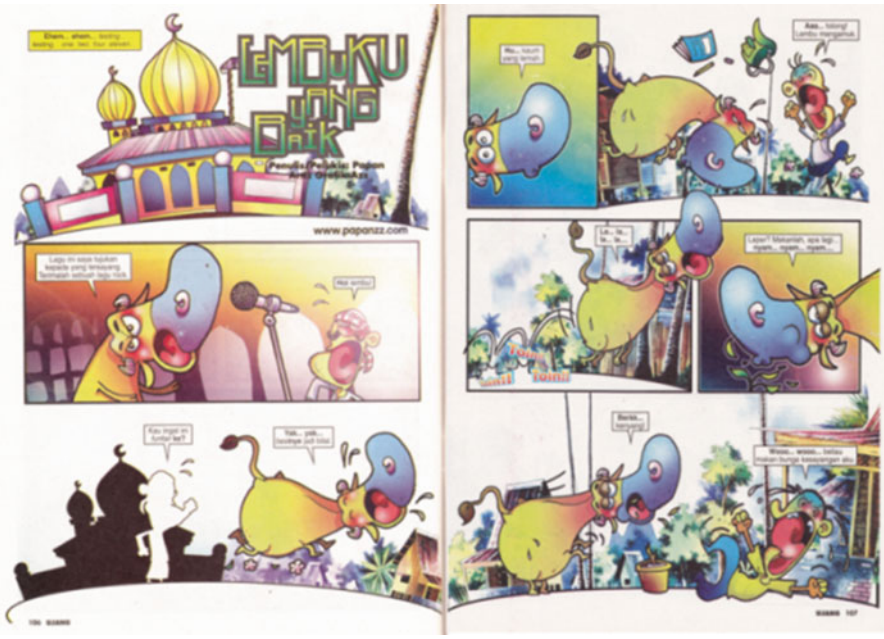

Fig. 19.11 Lembuku yang Baik, by Papan (writer/artist), Azs (graphic arts). *Ujang*, No.328, 15 March 2008, p. 106–107

Table 19.1 Visual design analysis

VISUAL DESIGN PANELS		
RIGID ☐	DYNAMIC ☐	EXPRESSIVE ☐

VISUAL DESIGN PAGE LAYOUT :			
SINGLE STRIP ☐	SINGLE PAGE STRIPS ☐	DOUBLE PAGE STRIPS ☐	MULTIPLE PAGE STRIPS ☐

VISUAL DESIGN				
TYPES OF CAPTION	TYPE OF SPEECH BALOON	TYPES OF EMANATA (VISUAL SYMBOL)	TYPES OF ONOMATOPOEIA (SOUND SYMBOL) :	TYPES OF VISUAL EFFECTS

Researcher then develops two categorization approaches based on this thought and analysis from the appearance of the comics visual form from the sample of Malaysia's comics magazine. There we can find a rigid grid design but with more flexible bordering which is named as 'dynamic' grid (Figs. 19.13 and 19.14) and also the other more free choice of design which is named as 'expressive' grid.

A dynamic grid layout can take the form of no fixed grid (Fig. 19.15), montage and floating panels (Fig. 19.16), irregular panels (Fig. 19.17) or diagonal panels (Fig. 19.18) or even as decorative layouts ([1], p. 74–82). *Gila-Gila*, *G3*, *Gempak* and *Ujang* have shown many aspects of these grid and layout treatments in their magazine's comics style. The grid system and layout exploration enable comics artist and cartoonist to enhance the readability and make the panel eye-catching.

Fig. 19.12 Comics panel grids, visual design: RIGID. Esha and Boy, writer/artist: Suraya, colourist: Atis, G3, No. 55, September 2008, p. 91

The purpose is 'creating an aesthetically attractive and easily comprehensible picture' in their own distinctive style ([1], p.46). Although panel arrangements should not be arbitrary and narrative flow is the main concern when designing the comics pages, some other comics artists dare to break the grid and experiment with more expressive form.

The Cartoon and Comics Characters

There are many ways to draw books on the technical parts in making comics. If we randomly pick a book on comics making instruction in bookshelves at the bookshop, we found it often open with an introduction to the basic tools, followed by a drawing of cannon of faces, then example of facial expression and how to age the face, and some others comprehend it with anatomical figure drawing to fashion clothing. The list categories are based on researcher intuition through identifying several repeated characters of cartoons and comics from all the four comics magazines. Most of the comics artists in those magazines have generated their specific stylization which can be identified through the list categorization.

Fig. 19.13 Tok Ripin n' Opah, writer/artist: Bijan, *Ujang* No. 318, 15 October 2007, p.100

The Drawing Style

Although some recent comics publication showed a strong influence from Japanese comics known by the name 'manga', the basic form of head typical-faces (shape) found in Malaysian comics magazines appears in many interesting designs. The influence of Japanese comics stylization seems very strong in *Gempak*, especially in their basic forms of facial and body gestures, but some comics artists appear to work

Fig. 19.14 Lawak Ketupat, writer/artist: Ciku, *Ujang*, No. 318. 15 October 2007, p. 103

Fig. 19.15 Naga Berapi, writer/artist: Gayour, G3 No. 55, September 2008, p.90

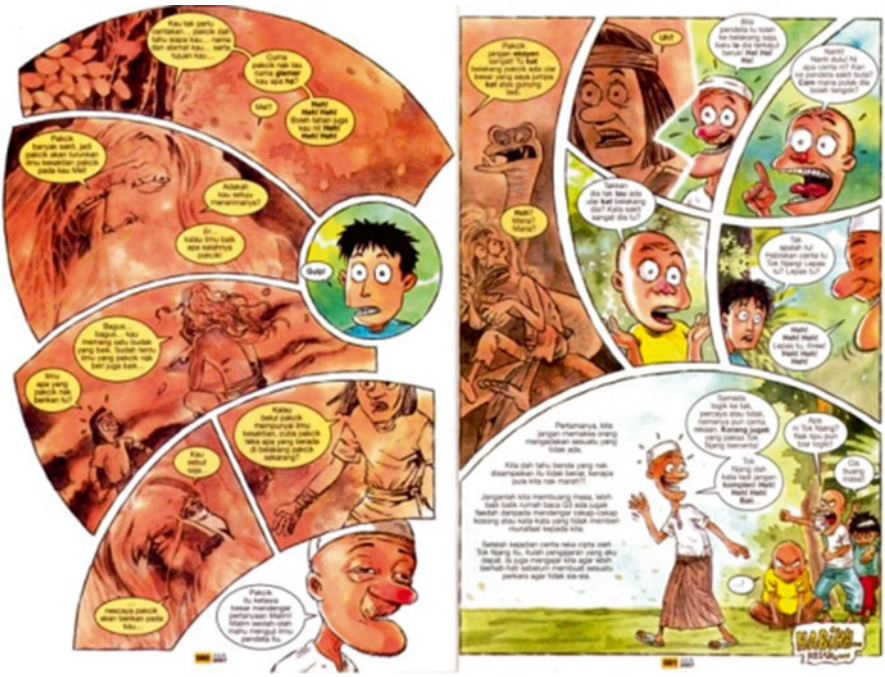

Fig. 19.16 Aku Suatu Waktu Dahulu. Artist/writer: Keladi, G3 No. 41 2007, p. 80–81

Fig. 19.17 G3 53, *The Last Koboi*, p.28

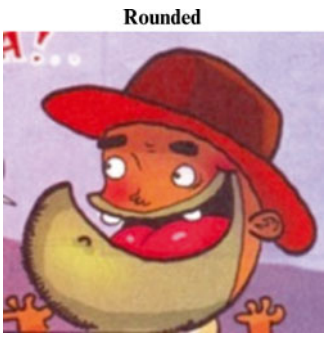

Fig. 19.18 G3 42, *Gelak Golek Golek*, p.18

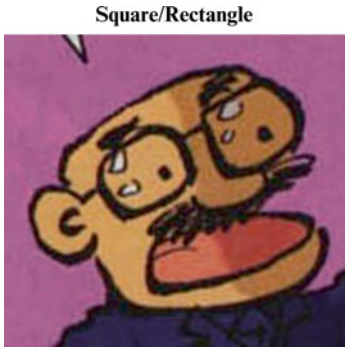

Fig. 19.19 Gila-Gila 690, *Ofis Corner*, p. 16

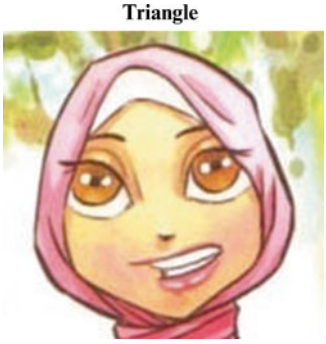

Fig. 19.20 G3 53, *Misterius Grapers*, p.31

out some hybridization of in between the cartoon style and the 'manga' style; as a result, it is enriching the artwork of many comic character designs in *G3* and *Ujang* magazine.

The formal analysis of the contents in a medium like magazine can be an exhaustive process. Concerning the content of comics itself, researcher limited its study of comics magazine solely to seek the visual characteristic since comics is an art form (Figs. 19.19, 19.20 and 19.21).

Fig. 19.21 Gila-Gila 690, *Adegan yang Seronok Kita Lihat*, p.29

From content analysis within the manifest formal qualities of comics as the work of art to seeing it in the broadest sense as a collection of signs, a researcher excerpts some particular characteristics to render it into codes and at the end provides construction of a modest proposition tool for analysing the art and design of comics.

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Chapter 20
Empirical Study on Game-Based Learning Phenomenon Through Mobile Design Technology

Nurdalilah Mohd Rani, Ida Hartni Zainol, and Muhamad Fairus Kamaruzaman

Abstract Digital games have become popular among children and adolescents. These games have somewhat become an integral part of their lives. Thus, due to this phenomenon, many institutions and scholastic organisations have come to realise the potential of mobile game design as an effective approach in education industry. Researches on mobile learning (m-learning) proved that curricular activity through mobile education game produces positive benefits mainly regarding skills development and motivation. However, the effectiveness of m-learning towards student's academic achievement is still under investigation. Aside from being accessible without the boundary of time and places, m-learning may benefit in some other ways. Hence, this paper reviews the literature describing the role of m-learning through vision, mind and psychomotor towards the children and adolescents from various researches that were made. Various articles and journals were gathered from, mainly, online database. The results gathered from the articles and journals were then discussed in this paper.

Keywords Technology-enhanced learning • Engagement • Motivation • Education • Mobile technology

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20.1 Introduction

In today's world, mobile technology has become a trend to the people of the nation. According to a survey made by Malaysian Communications and Multimedia Commission (MCMC), the penetration number of mobile phone per 100 inhabitants increases from 142.5 % to 143.4 % in the second quarter of 2013 since year 2012 [1]. Meanwhile, the total mobile phone subscriptions in the second quarter of 2013 increases to 42.6 million from 41.3 million in 2012 [1]. Moreover, 68.8 % of smartphone owners used their phone to gain access to the Internet [2]. This means, highly mobile device has become an essential part of their life to gain access to the Internet anytime anywhere. It has become the device of convenience where information can be accessed all the time, at all places. The ubiquity of highly mobile devices has somewhat influence the mankind generation in many ways. Children and adolescents are not exceptional in the adoption of mobile technology, and thus, it became an integral part of their lives [3]. Therefore, education practitioners and parents have somehow become concern of the current phenomenon affecting their children's routine. The scepticism on mobile technology continues with the growth of mobile gaming. It has been a concern that such technology may affect the students' academic development as well as their social behaviour. The widespread of this media is predicted – by the public – that it would infiltrate the classroom [4]. This shows that the public has mixed feelings about mobile technology. However, experts deny that banning these devices would be effective in overcoming the situation. Instead, they encourage to take advantage of the devices ability in engaging the students in classroom setting. Thus, mobile learning (m-learning) is becoming more and more popular every time. Many education practitioners and researchers are investigating the technological approach in engaging students to the world of education. Plus, with the establishment of Multimedia Super Corridor (MSC) with smart schools as one of its seven flagship applications, the government hoped to accelerate the realisation of Vision 2020 [5]. The smart schools, in the implementation of m-learning, are meant to complement the conventional learning method to engage with students in schools and institutions. Although m-learning is not a new method of learning, the virtues of it have not been fully exploited [6]. Thus, this paper is encouraging the use of m-learning in the education-based environment.

20.2 Related Research

Since technology undergoes a rapid evolution in the era of information and communication, pedagogy in education also seems to be affected. Researchers are becoming aware that the youngsters' digital cultures outside school are believably to be formed by the interactions with mobile and game technologies as they are by desktop PC applications [4]. Hence, it is only relevant for the education system to adopt game-based learning into the curricular activity to engage the students with game-based learning.

Mobile Phone Ownership Among Children and Adolescents

Teenagers and adults dominate the Malaysian mobile technologies market [7]. MCMC found that, in year 2012, 13.2 % of mobile phone users were 19 years old and younger [2] [8]. Almost four million mobile phone users were among the preteens and teens. Having such a large number of people using the highly mobile devices, it shows that the mobile technology is pretty influential in the everyday life, not just for the adults but also for children and adolescents too. In fear of negative influence that might be brought by the technology, scholars have decided that this phenomenon can also be an advantage for education. Hence, many researches pertaining to m-learning, specifically through mobile gaming, were made to overlook its potential as a new learning method. Therefore, m-learning has become a topic of interest by researchers across the globe [8]. As a result of owning personal computing device – including mobile phones – it is believed that the things that people learn differ from one another [3]. Different people with different personal devices see things from different perspectives. Liu [3] described the traits of these highly mobile devices as being able to transform the learning process from productive knowledge acquisition to active, creative, collaborative and integrated social learning. The public, generally, has ambivalent attitude towards mobile and game-based technology such as smartphones. However, most of them would agree that to completely take the technology out of the classroom would be impossible [4], so the best solution is to make entire use of the technology instead of getting rid of it [9].

Engaging with Mobile Learning (M-Learning)

The term 'mobile technology' is broad in meaning. Hence, Schofield et al. [10] define 'highly mobile device' as used for cell phone-sized devices that can fit in a pocket including smartphones and other devices, while 'very mobile devices' include slates, pad and netbooks. At the same time, according to Schofield et al. [10], 'mobile device' refers to larger devices such as laptops. Meanwhile, m-learning is still making its headway, so numerous definitions are in existence of defining the real meaning of m-learning. However, m-learning in this context refers to handheld technology that involves wireless and mobile phone networks in order to support, ease and enhance as well as to outstretch the reach of teaching and learning [11]. It involves highly mobile devices such as personal digital assistants (PDA) and smartphones. Just like e-learning, m-learning may also be classified as a type of technology-enhanced learning. M-learning is also defined as a natural evolution of e-learning, except it uses highly mobile devices and wireless transmission during the implementation of it. M-learning, through digital gaming, is a new approach of education that involves a touch of entertainment in which some may call it with the term 'edutainment' [7]. Edutainment is described as being both educational and entertaining. As the result of the scepticism towards mobile gaming, education

practitioners are trying to turn threats into chances by merging both entertainment and education. Researchers found that m-learning is advantageous to be implemented in today's education because of various reasons [11]. M-learning is said to be a big advantage due to its portability, connectivity, interactivity, context sensitivity, lifelong learning and individuality. Because of its portability, knowledge is accessible anywhere, anytime. It provides learners with connections with other people, devices or networks that made it easier to share information and knowledge. It is also a good method to encourage a cooperative learning activity, as learners will be able to interact through their highly mobile devices. And, m-learning is something continuous and learning can be altered based on previous learning circumstance. In a study involving primary school students regarding open source implementation of m-learning, a significant improvement was seen in terms of student satisfaction and performance for mobile learning environment compared to conventional approach [5]. This shows that m-learning is rather an effective way in improving student performance. Moreover, the satisfactory level shown from the study indicates that m-learning has the ability to motivate student to engage to a mobile learning environment. In terms of mobility of mobile technology, m-learning is beneficial as it can be used unobtrusively whether in the classroom or even at home as a complement to the activities in the classroom. M-learning gives the students more chance to focus on educational activity even outside of the classroom. It is even more motivational as the m-learning can be especially attractive for the students despite the conventional method that is becoming less and less attractive [13]. This results to an overall augmentation of the attractiveness of learning.

20.3 Methodology

Theoretical Analysis

Articles and journals were collected from various online databases including Scopus, IEEE Xplore, Science Direct, Sage and Google Scholar. In addition, statistics and survey results were retrieved from official website of Malaysian Communications and Multimedia Commission (MCMC).

20.4 Conclusion

From the perspective of Malaysian schools, the adoption of m-learning into learning environment contributes as well as improves the education surrounding. It is suggested as a powerful means to increase general knowledge through the exploration of creative edutainment and communication in the future. As we are living in the era of multimedia and communication, local education system has to catch up with the

ever so rapid evolution of technology and new media. Game-based learning has the potential to intensify the current education system through mobile technology. It has the power to engage the students into an effective learning environment and, hence, boost up the productivity of the education system.

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Chapter 21
The Concept of Formgiving for Color and Trim in Car Design

Fatin Ezrin Azhar, Shahriman Zainal Abidin, and Oskar Hasdinor Hassan

Abstract Car design is a profession involved in the development of road vehicles. Designer led in creating products and bringing together features of aesthetics, ergonomics, materials, manufacturability, and environmental consideration to the vehicle. Design is intuitive and holistic and requires higher-order thinking. This research, wherein researcher will present in this contribution, has the objectives to develop guidelines and establish criteria to facilitate designers with a concept of formgiving on color and trim in car design. The main questions are the following: What is the process of color and trim of formgiving for car designer in car design? How can formgiving knowledge contribute with aesthetical appearance in car design based on color and trim? The study will be based on descriptive and empirical research through design activities including methodologies of "color and trim" through protocol studies. The process of investigation is expected to be interactive since there is continuous need to relook at the research questions and sources of data and refine them after verification with new findings.

Keywords Car design • Color and trim • Formgiving

21.1 Introduction

The design and development of a modern motor vehicle is typically done by a large team including various disciplines. Design involves interdisciplinary input to make sure that the product can become competitive. In car design all phases of the product development cycle are of concern to the designer, from the initial concept through

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its development and manufacture and, finally, the marketing of the product. Therefore, designer needs to adapt a holistic approach toward designing, and form development is one of the areas which can improve the end product.

In car design process, form development is more integrated with other aspects of design such as aesthetics, ergonomics, and technical. The designers translate the ideas effectively using metaphors, analogies, and associations from other domain [1]. In art form terminology, the language of visual experience presents the language of vision. They involve the properties of (1) visual elements such as line, shape, mass, space, time and motion, light, color, and texture and (2) the appreciation of design principles such as unity and variety, balance, emphasis and subordination, directional forces, contrast, repetition and rhythm, scale and proportion, design summary, and style [2].

To counter the above issues modern design problem in this industry is facing which is still continuing today could likely still be a problem in the future [3].

The research objectives in this paper are to provide a connection between design and other aspects such as form and color and trim in car design. It is also to establish the contributions of different approaches of form development and color and trim in car design to the vehicle appearances based on the concept of formgiving in car design industries.

It is expected that the result of this research will help the researcher to establish guidelines and theories that would manage creative thinking and give researcher more structured on form decisions. Furthermore, it can develop the understanding of the concept of formgiving for color and trim in car design as well as methodology that will enable designers to ensure that certain standards and skills are met.

21.2 Definition

Car Design

In this paper *car design* is defined as profession involved in the development of road vehicles. Car design in this context primarily concerns with developing the visual appearance or aesthetics of the vehicle, though it is also involved in the creation of the product concept [4]. Car design is practiced by car designers who usually have an art background and degree in industrial design or transportation design. A car designer (also known as an automotive designer) is responsible to creating innovative, yet practical, design of new cars. This means as a car designer, hand sketch car designs and work with engineers to produce prototypes of the car before the designs become reality.

Color and Trim

In relation to color and trim in this research, the meaning of color and trim is that the material and color options for the vehicle interior are determined (see Fig. 21.1). From hundreds of fabric and leather samples as well as virtually endless color

Fig. 21.1 Color and trim designers' meeting for car design (Courtesy: Mercedes-Benz)

spectrum, the equipment variants for the future motor vehicle are determined. These include paints, plastics, fabric designs, leather, grains, carpet, headliner, wood trim, and so on. Color, contrast, texture, and pattern must be carefully combined to give the vehicle a unique interior environment experience. Designers work closely with the exterior and interior designs. All the control and display elements are designed and developed to the optimum.

Formgiving

Formgiving (design) is a Norwegian word which refers to the conceptual and perceptual process of developing the products gestalt into the physical form through an integrated aesthetic process [5].

21.3 What Is the Process of Color and Trim of Formgiving for Car Designer in Car Design

A designer's responsibility starts with the initial design idea and moves to conceptual development. From there, it moves to stage where the surfaces are detailed, after which the engineering department takes over to fully realize the project. Valtonen [6] has identified six different roles for the designer in current challenging market such as the designer as the creator, the designer in a team with mechanics and marketing, the designer as an end user expert, the designer as a coordinator, the

designer creating experiences, and the designer pushing innovation. The car design process goes through a problem solving and design process of analysis, synthesis, and evaluation. Generally, the process involves generating, transforming, and manipulating the visual form using intuition toward form development and exploring new form during evolution and resolution processes. Tovey [4] has noted that designers employ visual, creative, and intuitive techniques in making the special contribution to the design process.

In design many problems are fluid and vague and tacit knowledge [7, 8]. Therefore they need to be interpreted. Lawson [8] claims that before we can study properly how designers think, we need to develop a better understanding of the nature of design and the characteristics of design problems and their solutions. A combination of quantitative and qualitative research methodologies can contribute to significant insights in color and trim. One can think, for example, psychological and physical approaches, descriptive research, and empirical research through design activities with the various methodologies of "color and trim" protocol studies techniques.

The designing process is holistic; it concerns an understanding of the overall design solution as a visual entity. In moving from an initial unfocused concept to detailed design proposal, designers are required to display visual flair within a controlled yet changing formal vocabulary. According to Bloom [9], intellectual skill is equally important. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellect abilities and skills.

21.4 How Can Formgiving Knowledge Contribute with Aesthetical Appearance in Car Design Based on Color and Trim

Aesthetics is a broad disciplinary subject. The original Greek word "aisthetika" means "things perceptible through the senses." The process of sensory perception of human is complex and can provoke responses in the enormous store of experiences, memories, and behavioral pattern within each of us. Aesthetics is a very important element in design. Based on Lawson [8], the designer must understand our aesthetic experience, particularly of the visual world. According to Vihma [10], aesthetic experience can be characterized as a sense impression, a subjective appreciation of the object in which also interpretations of references take part. All bodily faculties through sensation are aroused; sight, touch, taste, and smell, hearing, balance, movement, and muscular effort help to form an aesthetic appreciation of an object or environment. Such experiences are import because this is the way how people understand the design:

> *The function of a product can very well be experiential, like to enjoy, to enrich, to inspire, to strengthen one's identity, etcetera, and* ***many believe such experiences are nowadays more decisive in people's buying behaviour than the primary or utilitarian function as***

> ***such***. *Making all the sensory messages congruent with the intended, overall experience is therefore an important task for designers*. (Hekkert [11])

Knoop [12] stated that people buy a car based on technical performance and cost only. Design for aesthetics and design for ergonomics, intelligence, user-friendliness, adaptability, etc., are fields which will surely be in the focus of research and development in the near future due to their role in enhancing product acceptance [12].

The characteristic of aesthetical appearance will make design marketable because it can capture the human interest for the end product. Knoop [12] has distinguished the basic characteristics that express the aesthetics of a product: shape, composition, and physical attributes. *High*-level characteristics such as style or fashion may be dealt with by expressing them in terms of the three basic characteristics [12, 13]. For "color and trim study," a proper understanding of the designers' work includes the ability to process a rich and diverse language of aesthetics, linguistic, and graphic elements. Methods for the design for aesthetics are the following: alternative (non-geometric entity-oriented) natural input mechanisms of shape, flexible representation of the initial shape, powerful image manipulation techniques, and free-form physical prototyping techniques.

21.5 Methodology

This study is based on a descriptive study and empirical research through design activities. It seeks answers to questions, which were *formulated* on literature reviews through problems, issues, and knowledge gaps and on what is often practiced by designers in automotive industry and academia by focusing on two elements such as (1) car design and (2) color and trim for car design.

Figure 21.2 shows a flowchart of research framework for this research activity. The domain of this research is qualitative in nature. The assessment will be on the syntactics (structure establishment) [3] and semantics (meaning carrying) [10] of form elements. These three different levels involve the following: (1) different levels of trend *development* /trend specific such as explorative, explanatory and persuasive, (2) different levels of career development such as practitioners and students, and (3) different levels of learning/work such as industrial/automotive design institutions and industries. The process of investigation is expected to be iterative. There is a continuous need to relook at the research questions and sources of data and to refine them after verifications from new findings.

21.6 Conclusion and Further Research

This study is an exploratory study. The research is based on a descriptive study and *empirical* research through design activities focusing on the appearance in car design based on color and trim through formgiving understanding. The study will

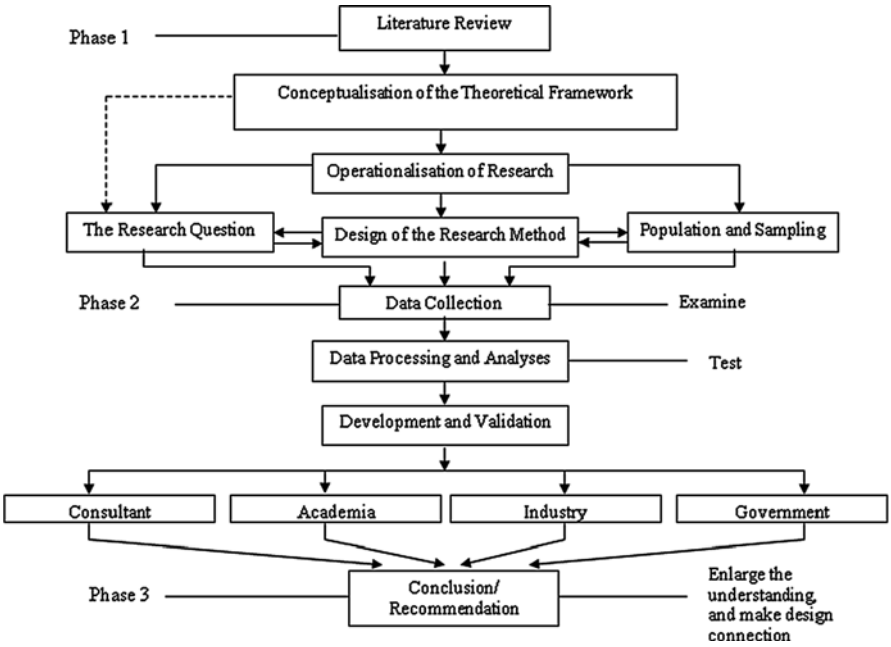

Fig. 21.2 Flowchart of the research framework

be on the pleasurable (hedonic) experience [14] through product presentation based on the elements of (1) impression (*what people "notice" and how the product stands out*), (2) appreciation (*what people "like" and how the product appeals*), and (3) emotion (*what people "feel" and what emotions the product elicits).* This paper is presented as an overview of my literature research, which I (first author) started in May 2013. My next steps include a study of the various methods and the identification of a research methodology for car design, reflections about the color and trim and the generic process in design, and literature studies which contribute to shed light on the following questions: (1) What is the process of color and trim of formgiving for car designer in car design? (2) How can formgiving knowledge contribute with aesthetical appearance in car design based on color and trim?

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Chapter 22
Unity Through Arts: An Approach for Harmony Among Children in Malaysia in Achieving the Concept of One Malaysia

Khairulwafi Mamat and Balamuralithara Balakrishnan

Abstract Art through its own variety of approaches could show possibilities in addressing diversity in a community that consists of multiple ranges of racial and cultural backgrounds such as Malaysian community. Arts education is essential for each child since arts cover the entire learning domain – cognitive, psychomotor, and affective. Utilizing the advantages of arts in a child's learning process and its possibilities to create harmony among communities from different races, a model for arts education called Unity Through Arts was proposed to create unity among Malay, Chinese, and Indian primary school children from different schooling systems – national and vernacular schools.

Keywords Arts • Education • Unity • Multiracial • Multicultural

22.1 Introduction

Malaysia is a multiracial and multicultural country which constitutes major races, namely, Malays, Chinese, Indians, Kadazan, Iban, and others. The Malays are majority (around 60 %), followed by Chinese (25 %) and Indians (7 %), while others represent about 8 % of total Malaysian population. The numbers show that the composition of population witnesses diversity in language, culture and customs, and religious beliefs. Therefore, unity among Malaysian is pivotal to sustain the harmony among different races. Unity is also essential for Malaysia to achieve the status of developed country by year 2020. Strengthening unity and national integration are the main agendas of the Malaysian government since independence. This has been documented, emphasized, and implemented in the Malaysian policies and decision making. The racial integration among Malaysian seems to be weak nowadays compared to 20–30 years ago. The gap between races is widening and it

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may cause more division among Malaysian. Therefore, the iconic 1 Malaysia is being introduced widely among Malaysian [1].

Basically, unity should start from young, and it must be cultivated since primary school among Malaysian children, but due to Malaysian education system that consists of two different schooling systems at primary level, the integration between children from various races and cultural backgrounds has not been developed.

Malaysian education system is divided into two different entities: national school system and vernacular school system. In national school, Malay language is the main language used for educating students, while in vernacular school system, Mandarin, Chinese school, and Tamil, Tamil school, are the main languages for education. The different education systems cause more division among Malaysian because 85–90 % in national school are Malays, while 99–100 % in both Tamil and Chinese school are Indians and Chinese, respectively. There is no common platform for children to mix around with their friends from other races and that hinders cultivation of unity among Malaysian children [2].

Unity should start from small, but the scenario in the primary schools seems to not reflect the composition of Malaysian. The school children are divided into three different schooling systems, and their parents tend to prefer sending them to school according to their mother tongue. The communication among children from different races is very minimal and the gap is getting wider. The polarization among different races gets worse and it might be a threat to the national integration, security, and development. Although there are some initiatives that have been done by Malaysian government through introducing vision school system, however it is not successful as intended. Some subjects have been taught in classroom that comprises the element of understanding different races, culture, and religion in Malaysia, but it is merely a conceptual knowledge which has minimal impact on children.

Racial integration needs to be practiced and it is should not be limited through classroom learning only; therefore, there should be a mechanism in the curriculum that enables school children from national and vernacular schools to work and create something tangible together which allow them to mix with children from other races and also make them appreciate other cultures and beliefs. With that motivation, we would like to propose a model program for national and vernacular school children that promote integration, toleration, and cooperation among different ethnic groups through arts. This proposed program will be providing an effective platform for unity among school children from different races and different schooling systems.

22.2 Literature Review

A study conducted by the University Malaya researchers and reported by *The Star* in year 2007 [3] has revealed findings that only 52 % of the teenagers in Malaysia said they had a friend of a different race. Socializing and mixing with other races were not something that concerned many of the respondents where about 13 % felt

that it was an issue, while the majority (63.9 %) were more worried about contracting a disease [3]. Those findings can be considered as a serious problem that needs to be solved before it could lead to other major problems in Malaysia. One of the major contributing factors is the degree of interracial interaction and communication among students in schools.

The Malaysian education system that divides into national and vernacular school systems has further created gap and isolation among different races in Malaysia. It is believed that Malaysian parents prefer sending their children to school according to their mother tongue to safeguard and protect the sanctity of each ethnic group [4]. As envisaged by Malaysia Prime Minister, the concept of "1 Malaysia" is one Malaysia that instills and cultivates national integration, interracial harmony, and the spirit of unity in which all elements are focusing on the same objective in uniting Malaysia from various races to embrace the spirit of oneness [5].

> There are now three mainstreams in the Malaysian school system, which are National school, Chinese-type national school and Tamil-type national schools. It is very crucial to bring these three school systems students to find ways and opportunities to interact among themselves through school activities. [4]

Moreover, our educational system should be able to support the practice of intercultural processes to ensure that the aim of intercultural communication can be achieved. Intercultural communication is also encouraged to be taught in elementary schools because children are more adaptive to cultural differences when they are young and they could adjust their behaviors as they get mature [5]. At the same time, a form of curriculum that is flexible and allows transformative learning from the children's aspect must be introduced. Therefore, there must be a common platform that brings all children together under one roof and involves them in activities that encourage intercultural communication that builds unity, harmony, and peace.

According to Guetzkow [6], arts provide a catalyst for the creation of social capital and the attainment of important community goals. UNESCO [7] guideline opined that

> educational content should also provide the artistic means to practice communication and to interact within various cultural, social and historical contexts. The multicultural education should adopt a collaborative learning process, including the sharing of ideas and open dialogue discussions. Every child's thoughts and opinion must be respected and any misconception about peace must be clarified through their own exploration and research from valid materials and resources. With this, each child will develop the satisfaction and respect for cultures that may seem different from them.

Arts are important tool for social integration where children who are exposed to arts do better in school and develop greater social and emotional skills. Arts education and activities bring positive outcomes in terms of sociocultural development where through the exposure to different cultures via arts, it breaks the stereotypes and develops teamwork skills, tolerance, and appreciation of diversity among the children from different races [8].

Samovar et al. [9] recognized the importance of intercultural knowledge in the educational environment where they emphasized that efforts should be taken to

appreciate diversity but at the same time finding ways to get groups of differing backgrounds to find a common ground. The integration of multicultural education in arts enables the children to embrace cultural pluralism.

Arts can promote and expose the children to different cultures and beliefs and empower the children to accept multicultural environment that lead to harmony and unity [10]. Therefore, through the arts activities, it can develop and enhance unity among children from different races where it will be a cornerstone for greater nation where children are the future for a country.

22.3 Unity Through Arts: Proposed Program

The main objectives of this proposed program are as follows:

(a) To develop a model program using arts as a platform for racial integration called Unity Through Arts to build racial integration among school children
(b) To create unity among school children from different schooling systems in Malaysia via this program
(c) To cultivate harmony in society through experiencing the cultures and beliefs of other races through arts

At the same time, the program will be including different arts such as visual arts, performing arts, and interactive media in which all the activities will be focusing on cultivating the spirit of oneness as Malaysian among the participants. The concept of unity, integration, and harmony is the main core of this model program in which the activities will be conducted in line with those concepts. The children will be able to express themselves who they are as Malaysian through arts.

The topics for the activities that will be carried out are as follows, where all the topics will be embedded through the arts activities:

(i) Who am I as Malaysian?
(ii) Who are they – others – as Malaysian?
(iii) What is 1 Malaysia?
(iv) Empowerment of Malaysian via unity.

The program starts with a unit called "Who am I as Malaysian?" which emphasizes on the aspect "Me" in the context as a Malaysian. It brings out the perspective of an individual on (i) who he/she is as a citizen in Malaysia, (ii) how he/she perceives his/her surrounding as Malaysian, and (iii) what his/her role as Malaysian.

Second topic of the program called "Who are they – others – as Malaysian?" highlights the element of "You" where it focuses on other individuals who are Malaysians. The unit emphasizes on the perception of a student on (i) who are Malaysians – peers and society at large – (ii) what is the role of others in Malaysia, and (iii) how is the relationship between you and others in the Malaysian society. In this part, it involves the elements of appreciating different people's perspectives, cultural values, and religious beliefs.

The third unit focuses on "What is 1 Malaysia"; it addresses the concept of 1 Malaysia which becomes the national mission among the students. In this topic, it concentrates on the (i) important aspects of 1 Malaysia, (ii) what is our – Malaysian – role toward 1 Malaysia, and (iii) how we can build the society with the spirit of 1 Malaysia. In this particular module, the aim is to recognize the participants' perception about 1 Malaysia and also their understanding on the objectives of 1 Malaysia. The final topic engages students in practicing "Unity as a Malaysian" where the topic addresses the concept of unity, harmony, and sharing common values as Malaysian. This unit also emphasizes on how to manage conflicts in intergroup and societal contexts.

22.4 Conclusion

It is believed that through this program, the spirit of Malaysian as one community which is built through different races will be realized. Arts can unite people from different backgrounds, and arts education which covers the entire learning domain could give better impact on children about unity. Through this proposed model program, a framework will be outlined in order to extend this project all over Malaysia where the topics and activities in the model program will be recommended to be embedded in the current arts education syllabus and pedagogy.

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Chapter 23
Kuih Putu Mold as a Matrix for Alternative Printmaking: Transformation Toward an Artistic Interpretation

Rosiah Md. Noor and Mohd Azhar Abd. Manan

Abstract Generally fine art artists produce an artwork that is intended to disclose self-expression and communicate an idea that comes from experience and a desire to share with the community. The idea initiated through the empirical research processes to undergo a series of action in order to change it components, subjects, form, and content so that the artwork can give the look of satisfaction and pleasure visually. This paper discusses the visual artwork by the researcher that is inspired from her culture. Transformation of applied art such as craft into printmaking formed a studio-based study experimented with new media which are different from conventional method. The advantages of alternative printmaking media are: more creative and innovative in the processed of materials and technique, have expected benefit in expressing awareness of Malay culture, and have the aesthetics of new forms in Malaysian contemporary printmaking. The result in terms of artwork also could contribute knowledge to the society about new development of printmaking in Malaysia.

Keywords Printmaking media • Alternative printmaking • Fine art • Malay culture • Artistic expression

23.1 Introduction

Basically, printmaking can be defined as an artwork resulting from the intermediary tool referred to as "matrix" such as "block," "plate," and "screen." Usually, block printing contains images that will be transferred onto other materials such as paper, plastics, or cloth through a controlled impression. Printmaking artwork can range

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from a single print such "monoprint" and "monotype" to repeated print with the same quality called "editions." Conventionally, printmaking medium consists of intaglio, relief, and lithography, and screen printing has long been produced by printmaker in the contact of fine art.

Technological advancement whether simple or complex technology is in line with the changes that contribute to the development of contemporary printmaking [1, 2] that included the new terminology such as alternative printmaking, dimensional printmaking, and mixed media printmaking. Recently, the terms such as hybrid printmaking and expanded printmaking are also popular worldwide even though the media and technique applied interchange with each other. Contemporary printmaking tried to go beyond the limitations of traditional printmaking focusing on materials and technique exploration.

Alternative printmaking that becoming increasingly popular since the 1960s in the West [1] while in Malaysia, it has been apply around 1980s [3] lean with new option of medium and/or techniques in printmaking to suit the artist's idea preference. The media used could be other than paper, and it's not necessarily used ink in the way of printing process. The pulled out printed on a two-dimensional surface, for example, could then be folded, stitched, hung, repeated in arrangement, or it could be printed continuously to be the object of a three-dimensional mold print and embossed [1, 4].

Most artists are free to choose forms and medium for expressing the meaning of an artwork with a particular presented purpose. According to [5], the reason fine artists produced artworks was to exhibit their self-expression, presenting or sharing self-expression, and to communicate on some ideas. A very considerable idea comes from experiences, dreams, and aspirations of artists, through its own self-expression to be shared with audiences. In addition, artists produced the artwork so as to fulfill aesthetic requirement and be absorbed to the human necessities of life such as fundamental needs, social and integrative [6].

Referring to the above, as an artist the author produces creative artworks as a form of expression of a woman who is always chasing her career. When referred to Malay culture which is often complex and watchful, looking at the commercial culture that is simple and direct, both patriotism and conflict caused guilt to Malays. At the same time all simple forms are accepted for the sake of time. The inner conflict has been the early inspiration to visualize into visual language that was translated to be the specific purpose in producing an artwork. The alternative printmaking medium was chosen because of its media compatibility with the idea to be presented.

In this study, the main objective was to create the printmaking artwork to instill the pride and sense of identity of Malay culture. Also in this paper the researcher's intention was to evaluate the relation of form and content of artwork. Using alternative printmaking medium and associated with cultural subject matter, either it could benefit more on cultural awareness or just the impact of visual art expression.

23.2 Background of Study: Arts Context

The visual art is a form of self-expression which is not limiting the needs of aesthetic and artistic value, but as a Muslim, the artist will realize that self-expression should be controlled and bound based on Muslim's way of life. Islamic art is based on the Islamic religion, subject to its principles where faith to Allah s.w.t is the basis for action in the style and manner of processing subject, form, and meaning or content of the artworks.

As a Malaysian Malay, where previously Malaysia was known as Malay Peninsula, rich with Malay culture, the love of traditional roots needs to be maintained. Therefore, in a series of work, namely, "Putu Oh Putu," the artist used printmaking to express the love on the losing tradition among the Malays themselves even though Islam and Malay cultures are synonymous and could not be separated [7].

According to [8], the production of art is not something that can be just about anything that can be accepted in the name of self-expression. Intuition or sense and emotional expression need to be paralleled and coordinated with logical cognitive process and also proper planning. This process will make the artists not only produce art piece but also realize on what have been produced, and the most important is to communicate using correct visual language. The role of the artist is vital in educating and cultivating sober attitude and responsibility as human beings that were born and trained in the Eastern region. The intensity of the heritage and tradition and the value of politeness and courtesy should be exposed that reflect the identity of a nation.

Nostalgic "Putu Cookie Mold" as an Inspiration

Walking around flea market in Ipoh city flea market not so long ago that sell many goods which are considered antiques by the salesperson, the artist came into contact with an object which is very eye-catching of "kuih putu" (bean cake) mold. It is made of hardwood with black color engraving with flora and fauna motifs (Fig. 23.1). Looking at the old and worn-out mold, the artist recalled how long it has not been used to produce "kuih putu." As a wooden mold remaining sold as antiques, the "kuih putu" is no longer popular nowadays, and it's hard to be found and enjoyed as

Fig. 23.1 "Kuih putu" mold

before. Remembering the sweetness and delicacy of traditional "kuih putu," the artist could ever imagine during childhood when she enjoyed the cake with a cup of coffee.

The "kuih putu" or also known as "kuih ketuk" or "kuih koya" is made of green bean flour mixture and sugar. The mixture is compacted into the cake mold which is then hammered out and dried under sunlight. The process of preparing the green bean flour is quite complicated in order to produce delicious "kuih putu"; therefore, it has to be prepared traditionally. The process of compressing the mixture of "kuih putu" into the mold and then drying is carried out manually; these are the factors getting less popular in this fast growing era.

Putu Motifs as the Tradition of Malay Culture

The appreciation toward the beauty of the engraving motifs of the putu mold by the Malay craftsman was an appreciation and also the continuation of printmaking concept by Malay ancestors. The "kuih putu" mold previously functioned as applied art, and the artist tries to bring its functions to fine art. For the artist, the interest, passion, and tendency to study the old Malay feature art artifact, especially "kuih putu" mold, do not mean to turn back to the traditional environment. According to [9], she claimed that choosing the elements of tradition as a subject is to maintain the essence of the ancient spirit and philosophy through the Malay world to the new world.

Reviving the Malay cultural philosophy in the new forms appropriate to the present technological era as said by Late Honorable Tun Abdul Razak Hussein, Prime Minister of Malaysia, at that time, officiating the Culture Congress 1971, the adaptation of the best elements from the civilization of science and technology with inherited traditional elements does not demolish the traditional value as long as the combination is stressed on the fresh and positive value [10].

Malay world is rich with traditional visual art in all aspects of life comprising from food, clothes, entertainment, decoration, games, and others. Despite the visual art implied, the philosophical value which symbolizes high personality, delicate pillar, and politeness also became the behavior of the Malay community. All these elements can be observed through the shape, forms, appearance, styles, and decoration reworked and always based on its own principles arrangement.

23.3 Methodology

Artists and creative researchers producing their artwork through art practice-based methodology [11, 12]. Reference [11] mentioned that "for creative artists the intuitive may work with the empirical, embodied and experiential through material practices and creative innovations. Creative arts based involve imagination, invention, speculation, innovation, risk-taking where new knowledge is made possible through the materiality of practice itself." They [11] also stated that

"creative practice, the practical work of the practitioner-researcher can be identified by its application and commitment with many modes of enquiry such as working through art or aesthetics."

In this research, the empirical experimentation's method that was based on fine art studio practice was used to get suitable techniques that are needed in producing artwork with alternative printmaking approach. The process of art making was divided into two phases. The first phase is the process of generating of ideas, while the second phase focuses on studio works. Both processes involved several activities of which are the process of thinking about the idea, describing the form of the artworks been made, documenting ideas in the form of notes and sketching, designing working processes, finding the appropriate materials and tools, and experimentation with a wide range of possible techniques and media that can channel the meaning of ideas to be presented.

23.4 Result and Discussion

For the purpose of continuity of traditions, the traditional mold has been applied as subject matter in visual art as a way to not be forgotten. The artist has applied this carved mold in the form of alternative printmaking that combined conventional two-dimensional methods that give a three-dimensional effect. For example, in a work entitled Between Two: series I–V produced in 2008 (Fig. 23.2), it was a mixed media print using relief linocut print method, producing "kuih putu" mold from paper-mache. Even though this artwork is categorized as an alternative printmaking, it's presented as conventional. All five works with each print-sized 15 × 15 cm panels have been produced twice and signed and glass-framed for each panel.

The linocut print is using a swirl or spiral technique that contradicts with negative shape arranged vertically, in square or triangle. The swirl line was carved inconsistently and harmoniously with the positive shape of "kuih putu" motif. While the product from the mold print is the result from the original color of the paper, collaged at the predetermine position.

The work Between Two means that the differences between two prints which are mold print and carved print make "two-faced" differently but actually the same. It's similar but not identical. The similarity of motifs and shapes can be repeated, but "kuih putu" and the carved mold will not be maintained and preserved. It's between memories, nostalgia and reality, the old and new, and the former and present. It is hoped that this traditional thing and modern life can create continuity.

Based on the work entitled Between Two Coffee (Fig. 23.3) which is produced in the same year as the above artwork, it also used the same mixed media printmaking method. This work is produced with a monoprint sized 68 × 46 cm, also presented based on conventional print method. Besides that, the color of "kuih putu" is arranged in the middle between two cups of coffee on the left and right side and the creep flora motifs as a background in the composition.

For artwork number 2 (Fig. 23.3), woodcut print technique and "kuih putu" mold print from paper-mache are combined. An artwork number 1 (Fig. 23.2), the "kuih

Fig. 23.2 Between two: series I–V (2008)

putu" image was made as a three-dimensional look so that it will easily be known as food. Unlike if produced in a two-dimensional look, it just gives a decoration look as flora in the background. The flora image used as a subject matter has been changed based on "kuih putu" motif, represented as an image of tablecloth. The repetition of this motif is to establish harmonious principles and movement in the whole artwork.

The colorful image of three-dimensional "kuih putu" is produced during the making process of paper-mache, and it can be maintained after it is taken out from the mold. The contrast in colors produced means to create differences, and it differs from the original color of "kuih putu," as the reason to produce opposite direction between original "kuih putu" and modern colorful cakes. The printed "kuih putu," collaged and composed vertically on the center of composition, gives another form of contrast or conflict with a real Malay dish order which is full of politeness. This has created confusion and mix-up between the traditional and modern style.

Fig. 23.3 Between two coffee (2008)

Placing "kuih putu" in the middle between two cups of coffee where one of it is the "instant coffee." The issue on "instant" has been raised in the culture of preparing food as the artist herself emphasizes on something fast, quick, and promptly. The work "Between Two Coffee" (Fig. 23.3) tries to explain and gives an idea on the identical motif and form that can be repeated, but the function of "kuih putu" still cannot be maintained as the current "instant" main dish. Approach on various dimensions approached means there is to bring conflict between loves toward traditional and present greed.

Although these works are considered to be able to create awareness of culture and regular expressions to the artist, the researchers could not deny that a piece of artwork is very subjective to others. Basically, visual language speaks by using an understanding of the elements and principles of design. Even though not everyone could communicate visual language without knowledge, with the detail information, hopefully the society could understand it. Otherwise, human instinct was born with aesthetic needs, and the society is sure to be able to appreciate the visual artwork in their own way.

23.5 Conclusion

Printmaking artwork as painting and sculpture is made up of mutually related form and content. Whether the artist emphasized more on form or content, both are related and relevant for certain reasons; however, the meanings to be presented

required a specific form of treatment. A quality work in accordance to [13] is the compliment of the subjects, form, and content. Through the works in "Putu Oh Putu" series, the exploration on alternative material such as paper-mache with the mold technique has given advantages in terms of the appearance of the original bean cakes (kuih putu). The effect of relief "kuih putu" gives more appreciation compared to if printed in two dimensional only. The properties of the mold can be printed with the same shape and give more values to the dish itself. The combination of two-dimensional print with three-dimensional elements gives extra visual effects to be enjoyed and gives more satisfaction to the artist.

The artist decided to create the artwork that gives awareness of the importance of the traditional heritage to be praised even though it's not been functional nowadays. The society, especially the new generation, should continue to be exposed and educated to be aware and respect our own traditional heritage in the line of building our own identity and fostering the sense of patriotism. As a true Malaysian, we supposed to realize and have some feeling to love and appreciate our heritage. This proves that the aesthetic elements of the Malay traditional mold cake do play an important role not only in the Malay culture, but also in disseminating the immense potential of art and design as the foremost aesthetic elements in our daily lives.

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Chapter 24
The Study of Proverbs as a Way to Enhance Ethical Values in Artwork

Siti Hajar Abd Rahman and Hema Zulaika Hashim

Abstract The Malay proverbs are one of the traditional Malay literary works that resemble other literary works. In addition, various aspects and learning for the purpose of educating and teaching and for aesthetic satisfaction are also used by their authors to benefit the readers. The simple but meaningful style of conveying values is useful thoughts for living in our daily lives. The free styles of writing, unconfined to a certain language style, have made the Malay proverbs a figurative form of speech that are rich in norms and worthy advice, comparisons, maxims, principles, and mannerism in the lives of people. The aim of this research is to deliberate on several Malay proverbs (metaphors) as sources of inspiration for several Malaysian artists on how proverbs can reveal through visual arts. The study attempts to explain the power of proverbs and the phenomena of critical thinking as a natural way of categorizing the human ethical value experience. This research will at least encourage the society to feel and appreciate the beauty of traditional Malay literature and the beauty to execute good ethics values in life.

Keywords Malay proverbs • Ethical value • Critical thinking

24.1 Introduction

Every literary work in the world is considered as one of the important aspects of culture. This can be seen through the worlds the literary works of a acknowledgment towards literary works of a nation recognition of the culture significance. Before the local community knew how to write, only oral communication was their means of conveying feelings or thought, and this was known as oral or verbal literature. It began from short dialogues to long until it described a story [1]. Among

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them were proverbs that handed down from person to person or narrated by a storyteller.

Proverbs are verbal literary works that have been applied as a guide in society. It serves as a form of an entertainment that not only is practiced but also serves as a tool to educate and teach human behavior. Sharp and strong criticism is a function of proverbs in conveying effective and cynical advice in a subtle and polite manner. The perspective taken by the author is focused on the coalescence of communication that exists in the proverbs themselves. The coalescence of the communication meant is the inculcation of values in the beauty of the language present in the Malay proverbs. These display the dual function of ethical values among the Malays such as the act of caring; unity; being honorable; respecting the elders, parents, leaders, and the customs [2]; and so on.

Proverbs

Proverbs or better known as the saying of the elders consists of *bidalan, pepatah, perumpamaan*, and *simpulan bahasa* [3]. All of these are heritage that still prevails until now [4]. It contains wise words to describe life experiences and frequently used, later became point of comparisons' examples and lessons to be taught [5]. Natural elements and phenomena that surrounded our ancestors became sources of inspirations for forming the proverbs. Most of these came from observations and life experiences. It became a soft and effective approach to give advice, to suggest, and to imply in a manner more easily understood.

Ethical Values

Several ethical values use the folklore as the best source to show the traditional values of the Malay society [6]. Ethical values are used as the indicator of a person's personality because it describes whether someone has the flair for using good and proper speech [7]. The practice and instilling of ethical values can strengthen the attribute and self-worth of the Malays. Besides that, the reward of instilling good behavior can protect the harmony of other societies and can create a good Malaysian ethical values, and ethics are closely related [8]. Both function as the norm in culture of communities at all levels of social and professional lives. Both are the main features of a civilization and its manifestations can be seen through various ways and media.

24.2 Language

Language is like raw material that is formed, combined, designed, and invented according to the capability and creative value of language speakers until it achieves the zenith of beauty [9].

Art in Language

Art in language or art of speech refers to beauty and fine forms that can be attained by a language based on the internal capability of the language. According Ludwig Wittgenstein, a philosopher of language from Austria, there is a hidden meaning in the language that we use and speak about the orientation of life that encompasses feeling, values, thoughts, and culture. This is because it is through language that we can conceal and reveal our thoughts. It is through language that we are able to create and end a conflict.

Language as a Weapon

Language as a weapon was discussed by [10] that can be used as a tool to achieve a goal or intention. It has a dual function: as a tool to defeat and defend all forms of confrontation and as a means of illustrating the artistic beauty in the wonderful language. It reemphasizes that language is the best tool for finding all forms of knowledge [11]. This is because language is the best way to monopolies on knowledge. Therefore, to posses the sharpest and most effective weapon of language, one should defend their very existence and self-worth as highly civilized people. One fine word and honorable gesture can subdue any anger and restore peace and harmony.

24.3 Analysis Findings Artwork Inspired by Malay Proverbs

In efforts to appreciate the country's works of art, the author hopes to study the perseverance of the country's artists in elaborating the community theme and social criticism that have been merged with the Malay literature. It is certain that these efforts, moreover with the campaign "Budi Bahasa Budaya Kita" carried out by the Ministry of Culture and Heritage, will continually promote all forms of artwork as the platform that will help convey the nation's cultural values.

The author has discovered various forms of Malaysian art that presented various approaches, forms, and meaning in the works that supported and took inspiration from the richness of the Eastern and Islamic culture. The works chosen by the author under the subtitle has focused on works that drew inspiration from non-narrative folklore. The beauties of ethical values were artistically interpreted in these works in efforts to address the issues at hand. The writer refers to several artists that were fascinated by traditional culture found in Malay literatures, way of life, and civilization.

In presenting Fig. 24.1 that correlates with the Malay traditional proverb, Johari uses two similar elements to transform his metaphor into a form of cynicism. The coconut shell is associated with the group of close-minded and ignorant group of

Fig. 24.1 Seperti Katak Dibawah Tempurung, material: mixed media, year: 1996 (Artist: Johari Said)

people, despite having travelled the world. It acts as the main metaphor to create an illusion to the audience to make them assume that there is a frog under the shell in the artwork. This was the message that Johari is trying to project to illustrate the situation in reality regarding the behavior, style, and way of thinking among the Malays.

The analysis done with the works of Fig. 24.1 found that they are closely linked to the Malay traditions. Even though with the respect to a form that is by clearly transferring traditional art motifs, he has succeeded in creating a new form of visual art suitable to the essence of his work. Figure 24.1 makes a lot of reference to the elements of literature such as the metaphors and proverbs. The strength projected form this works is focusing more towards traditional culture found in literature, ways of life, and the Malay civilisation. The interesting conclusion that can be made from the analysis (Fig. 24.1) is the technique of using speech in the form of visual art that is more subtle and civilized to describe the characteristics of Malay.

In Fig. 24.2 "*Tuah Jalak*" or its synonym "ayam jalak" is a proven that visualizes strength or bravery of a person. In this artwork, the rooster is drawn as an animal that has championed characteristics: brave and courageous. The subject is frequently associated with the lively conditions of the kampong and represents the spirit, strength, and labors of Jailani as an artist. The issues being brought are more on the spirit of a winner that involves the inner strength and the readiness to fight like a winner in the field [12]. The image of the rooster and many secondary images are positioned randomly in various sizes.

Much like the images used in his other works, he is more inclined toward easily identifiable subjects and tries his best to maintain his own roots and culture, the Malays, from being extinct [13]. Therefore, the subject in the artwork is directed to

Fig. 24.2 *Tuah Jalak*, material: mixed media, year: 2004 (Artist: Jailani Abu Hassan)

another subject that can be seen easily, that is, the rooster. The images of animals used by Jailani quite clearly shows the relationship between the function of Malay literature that is as a form of entertainment as well as a means of educating its audience. Here the author holds the opinion that the chances of Jailani incorporating into his work stories of animals that are also didactic literature [14] is the most effective way of instilling positive values within the self.

Much like the animal stories that we read in Malay society, it is clear that this artwork presents good values underlying them. The value found can be used as examples and guards for every individual as preparation to start living in society. Whether the art enthusiasts realize it or not, Jailani is also an artist to be proud of. He tries to revive the richness of the Malay culture and heritage through constructing and deliberating his work to the public. He has succeeded in revealing the beauty of the Malay language through presentations of the unique and antique subject of research [15] so that these can be reintroduced and learned by the new generation. In general, all of the artists use symbols to express the meaning of literature, culture, words, actions, and the beauty of objects that had been borrowed from a group of the society. In fact the writer agrees that the language itself consists of a chain of beautiful symbols. The anthropology community also feels that the association between symbols and meaning can be determined by each other's cultural experience and not by individual experiences [16]. Symbolism in short is the representation of something that usually have no form (e.g., attributes, spiritual, love, hatred, and the like) in comparison to something with form or an object.

In his book, "Interpretation of Dreams," Sigmund Freud had also stated that sometimes the use of symbols to represent unconscious reality can be read in the works of authors. Therefore, in such a situation, there is no question as to whom the symbol belongs to. Therefore, we as creators of symbols should be sensitive and understand our existence as creators of those symbols because there exists them who are the real owners of that symbol. This situation is similar to the existence of Malay literature in various forms and styles because language itself forms beautiful bytes [17]. Therefore, the language that we use reflects our personality, origin, social culture, education, and other related matters. Such is the case otherwise.

24.4 Scope and Limitation of Study

In this research the author chooses to cherish the uniqueness of Malay proverbs as reference for visual art. The effort of the artists in transforming the Malay proverbs in the form of visual art is a bold and innovative act [18]. Literature is the seismograph of life and not only records but also analyzes man and society. Literature is needed to make a value complete in a society. Along with that all forms of artworks can be promoted as the platform that will help convey the nation's cultural values.

24.5 Methodology

Author will be doing a detailed descriptive research on the selected artworks done by Malaysian artist to discover the usage of type of traditional Malay literature, concept, and content [19]. The critical processes such as describing the facts, analyzing facts, interpreting evidence, and judging works of art are used to explain and to describe the process of an artwork and issue.

24.6 Significance of the Research

The significance of this research will benefit the people of Malaysia by reviving a more cultured way of life. This research is tandem with "Kempen Budi Bahasa" to give a long-term impact on the people as well as psychological impact especially among the young generation on the importance and advantages of having and practicing good mannerism and conduct, values noble in the aspects of community life.

24.7 Conclusion

Proverbs in traditional Malay literature can be a source for looking into ethical values in society. When discussing literature, it cannot be isolated from man and society. This means that literature exists because of the relationship between these two factors. Literature is the seismograph of life [18]. That is literature not only records but also analyses man and society. Through literature, many lessons are learned.

The author learns that literature is needed to make a value complete in a society. This is because through literature, society can learn about history as they improve their moral values and lives. Folklore such as proverbs developed in form, type, and function according to man's journey in life [20]. There are elements of morality, beauty, instinct, justice, piety, wisdom, and Tazkiyah in literature. It can be communicated to the soul in a natural but effective way.

The potential of proverbs and other genres of the traditional Malay poetry in educating its society is further enriched with emotions, sensitivity, and wisdom of its author. The subtle form of teaching is illustrated by the author through solid presentation that is artistic and beautiful. This will clearly encourage the audience to always be wise, to practice good mannerism, and to always instill good values in their lives.

It can be concluded that the practices and instillation of ethical values through language in literature will strengthen the personality and self-worth of individuals. Besides that, the benefits of various good deeds that have been instilled in the daily lives of individual can also serve the harmony of other societies. It also has the potential of producing a better cultured group of people.

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Chapter 25
A Game-Based Learning: A Study on *Wau* Among Selected University Students in Klang Valley, Malaysia

Mohd Fairuz Ali, Anita Morah Abas, Aloysius Yapp, and Maithreyi Subramaniam

Abstract The popularity of Wau flying, its making, and types are not widely known to Malaysians. This signature is losing its brightness and is unbearable to compete with the booming era of electronic and addictive digital games. Viewing this scenario, the research was designed to transform the traditional Wau flying into computer digital game. Mixed methods were conducted – distribution of questionnaires with 66 respondents; pretest and posttest to 46 respondents from SEGi College University and University of Selangor (UNISEL), respectively; and researcher's observation. The results show a good sign of attitude change before (testing general knowledge and understanding about traditional Wau flying) and after (transforming the game using Adobe Flash CS5 incorporated with ActionScript 2.0 – the planning, ideation processes, and overall functionality of the game). The game designed was fully accepted and can be a good platform for edutainment and a milestone in making sure that the identity of Wau is well preserved.

Keywords Computer digital game • Wau • Wau Kucing • Malaysian traditional game • ActionScript 2.0 • Edutainment

25.1 Introduction

Kite flying is a popular game globally, and it is known as *Wau* in Malaysia, a cultural heritage and a famous Malay pastime and traditional game of people of Terengganu and Kelantan. Although Malaysian tourism and Wau lovers have promoted Wau with Wau museum located in Pasir Gudang, Johor, and Tumpat, Kelantan, as well as by organizing local and international kite festivals and competitions, yet the

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recognition of *Wau* flying, its making, and types are only limited to certain festivals and a specific target group, not widely known to Malaysians. Hence, *Wau* is said to have not received wider publicity, promotion, and exposure through print, electronic media and social networking, aggressive effort from government agencies, and *Wau* lovers. These factors refrained the young generation and public in general to build interest in the game. As firmly stated by Siri Neng Buah, the Director of Intangible Unit, National Heritage Department, that Malaysian traditional games are gradually forgotten by the youngsters and will be crumbled if no efforts to accommodate the traditional game facilities for the public to play [1, 2]. Likewise a foreign website *newslite.tv* found that modern children have ditched traditional games in favor of high-tech gadgets. In a survey, 93 % of children said they would never play marbles, half of them had never even heard of the small glass balls, three quarters of kids never played "tag," and 87 % have never heard or played ring-a-ring o' roses [3].

Obviously *Wau* is losing its grip to compete with the explosion era of game technology and rapid growth of digital games that have been designed for all walks of lives. The massive influence has created a new pop culture of online game which provides unlimited volumes of downloading the games with no cost and play at one's own will and risks. The mushrooming of computer and digital games in the market is designed competitively in almost all media and communication devices such as 2D and 3D console games, computer games, iPad, iPhone, mobile phone, and many more. On this note, scholars, researchers, and game developers have written countless scholarly and non-scholarly articles on how playing computer and digital games can be a sufficient instrument as social agent to inculcate a sense of formal and informal learning context, [4] a new wavelength in the edutainment industry. Clearly computer game is said to be able to educate the gamers consciously and subconsciously in a number of ways – testing general knowledge ("Brain Power 2!"), warfare tactics, and strategies ("Call of Duty: Modern Warfare 3"); improving and enriching gamers' vocabularies ("4 Pics 1 Word"; "Abby's Adventure Game"); and inculcating the culture of volunteerism and community service ("Food Force") [5–8], strategic thinking, planning, communication, negotiating skills, group decision-making [9], and many more. Interestingly a game-based learning is able to promote and preserve traditional games from the perished and instill cultural diversity which brought a new level of understanding of cultural differences through computer and digital games such as preserving historical events of the Egyptian culture in "Lord of the Two Lands," "High Priest of Every Temple," and "Pyramid Bloxx" and promoting Malaysian traditional game *Congkak* in "Congkakcraze" on iPhone and "Seremban Stone" (*Batu Seremban*) on a Facebook page [10–14]. The transformation of these two Malaysian traditional games was on the same wavelength with the researcher of converting *Wau* flying into a computer digital game as a means of preserving the critical *Wau* traditional game from being obsolete and encouraging gamers to learn more about the game. With this in mind, we examine this study based on four objectives: (1) to educate people on the history and myth of *Wau*, (2) to promote the uniqueness and classiness of the Malaysian traditional game *Wau* through computer digital game, (3) to preserve the value of traditional

game *Wau* in concordance with the evolving of digital game technology worldwide, and (4) to sustain *Wau* as the national symbol.

25.2 Methods

Mixed methods were used in conducting this research using four different stages:

(i) Data gathering and collection by distributing 100 questionnaires to 66 respondents responded from SEGi College University (30 respondents) and University of Selangor (UNISEL) students (36 respondents), respectively, to test their general knowledge on *Wau* with no access of playing the game on computer [15]
(ii) A pretest is administered at SEGi College University, Kota Damansara, with 20 respondents.
(iii) A posttest was conducted at UNISEL with 26 respondents. The idea of conducting in two different universities was not to compare the respondents playing skills and understanding level of the game; rather, the limited access to the university and computer lab has pushed the researcher to find another location to conduct the gameplay with the small number of respondents. University students were chosen as focus group in this research as they represent the mediocre views in between adults and the younger generation. In the pretest and posttest, different respondents were given the same set of questionnaires to analyze their attitudinal changes toward the *Wau* computer game. The questions were distributed to the respondents upon the completion of the *Wau* game to Level 2.
(iv) Researcher's observation in the computer lab while respondents playing the game.

For the game programming, the researcher used a user-friendly program with simple and light technical program of Interactive Flash-based computer game with beautiful and colorful fauna and flora design of the *Wau* for easy learning process in creating a pleasant and fun ambience of the game. The game *Wow the Wau!* was designed up to Level 2 only. The researcher used Adobe Flash CS5 incorporated with ActionScript 2.0 where the results and final output can be run on a computer. As an educational tool, the four different types of *Wau* (*Wau Bulan* or Moon Kite, *Wau Jala Budi* or Leaf Net Kite, *Wau Kucing* or Cat Kite, *Wau Helang* or Eagle Kite) were displayed with a brief explanation of each *Wau* at the beginning of the scene, but the main character is only *Wau Kucing* (Cat Kite). It is believed that this kite is used to drive away evil spirits and for weather forecast [16]. The high-pitched tone this kite produced is significant to a cat's pitch. For that reason, the concept of the game is inspired with the myths of *Wau Kucing*. The game is played by controlling the Wau Kucing to drive away the evil spirits using the assigned key on the keyboard. The idea of having bird as the secondary obstacle is to add challenges to the game.

As for the game scenery, researcher used a Malaysian village environment with paddy field and a scarecrow to give a real mood and excitement while navigating *Wau Kucing*. Other features included:

- The game can be run on Windows and Mac platform.
- Single-player mode.
- Colorful and cute characters (bird and evil spirits) to capture the gamers' attention throughout the game.
- Using arrow button to navigate the Wau Kucing and control (Ctrl) key to produce the hummer sound of Wau Kucing.
- Background music using the national musical heritage, i.e., caklempong and sound effect for Wau's hummer sound to make the game more vigorous.

25.3 Results and Discussion

Survey

Hundred questionnaires were distributed to 50 students of SEGi College University and 50 students of UNISEL with 66 respondents responded at the age group of 18–32 years to test their understanding and general knowledge on *Wau*. The results have shown that the majority of the respondents (95.5 %) are aware of the existence of *Wau* and have heard about it; apparently 46 respondents (69.7 %) have never played *Wau* in their life, while 40 respondents (60.6 %) have no knowledge about the history or myths of *Wau*, and only 39 respondents (59.1 %) know about *Wau Bulan*. *Wau* is not popular and rarely played by Malaysians nowadays due to lack of medium of education on *Wau*, difficulty to find *Wau* in the market, and monopolization by digital games. Thirty-seven respondents (56.1 %) claimed that they have never come across any educating topic about *Wau* in the media, and only 10 respondents (15.2 %) have heard or seen *Wau* on television. Presently, playing *Wau* is not in the heart of the young generation due to a few factors: media was blamed for not promoting aggressively on *Wau* game, kite festivals, and local and international competition organized in Malaysia every year, the *Wau* making is very difficult to master, and the aggressive promotion on Western computer and digital games through online media and social networking. Fifty respondents (75.8 %) agreed that media is the appropriate channel to promote and encourage people to play *Wau* and is able to preserve the uniqueness value of the *Wau* itself. Interestingly, 42 respondents (92.4 %) agreed that digital game is one of the best tools to educate and preserve the traditional game from fading away. Based on the results, it is clear that playing *Wau* is not in the heart of the young generation; consequently, the popularity of *Wau* game is declining as 60 % of respondents do not know anything about *Wau* even though *Wau* is one of Malaysia's national symbols and cultural heritage.

Pretest

Twenty respondents of SEGi College University gave immediate feedbacks in a questionnaire of 14 questions after playing the game. The same respondents participated in the first survey, but due to limited space in a computer lab, only the first 20 respondents had the opportunity to participate in this pretest phase. At this level, the researcher is able to identify the weaknesses of the game and the overall functions, characters, background design, and music according to the feedback such as 7 respondents (35 %) were unable to finish Level 2 because they found that it is difficult to accomplish, 3 respondents (15 %) are having problems while playing the game, 3 respondents (15 %) feel that the movement of *Wau Kucing* is slow and the game was not explained adequately, and 10 respondents (50 %) feel that Level 2 is difficult. Overall, majority of the respondents found that the game is user-friendly in terms of navigation and interesting; the background, choice of music, and sound effects are suitable; and the background and character design are attractive, with 18 respondents (90 %) giving a positive feedback that the game is able to educate people on *Wau*.

Posttest

Before the posttest is executed, few changes have been amended and upgraded based on the researcher's observation and feedback in the pretest phase. The changes made are as follows:

- Movement of evil spirits in x-axis to make the game more challenging. From observation it was found that the player was not optimally challenged and distracted because the movement of evil spirits was not fully assigned on a certain area of the game stage.
- The information on the obstacles of the game was not adequately explained. Therefore, further explanation was amended in the "How to Play" scene.
- Movement of Wau Kucing is offscreen when moved to far left, right, top, and bottom of the stage. Therefore, the movement of Wau Kucing was fixed into the stage boundaries.
- The sound of Wau effect was a bit loud, and it was reduced to an acceptable volume.

The posttest was conducted at University Selangor (UNISEL) with 26 respondents participating in a computer lab. The same method used in the pretest is applied in the posttest with the distribution of same questionnaires toward the end of the game. Twenty-two respondents (84.6 %) were able to complete both levels. Only one respondent was having a problem while playing the game. Eight respondents (30.8 %) found that Level 2 was not easy to accomplish, while 4 respondents

(15.4 %) felt that the music was too loud. Similar with the response in the pretest, majority of the respondents found that the character design was suitable and attractive and the background, choice of music, and sound effects are suitable, with 26 respondents (100 %) giving a positive feedback that the game is able to educate people on *Wau*. The researcher took immediate action by reducing the music volume to an average level of acceptance.

Final Design of Wow the Wau!

Below are some of the final screen captures of *Wow the Wau!* game after a few changes have been made (Fig. 25.1).

Based on the feedbacks on both pretest and posttest, it can be concluded that the *Wow the Wau!* game does not contain major problems on its overall performance of designs and functionality. Generally, majority of the respondents believed that *Wau* in a form of computer game is an appropriate platform to educate and to entertain gamers. All respondents confidently ascertained that the game will be accepted locally. The study revealed that Wau needs to compete with the computer and digital game culture to be accepted by the young generation that were left in the dark with

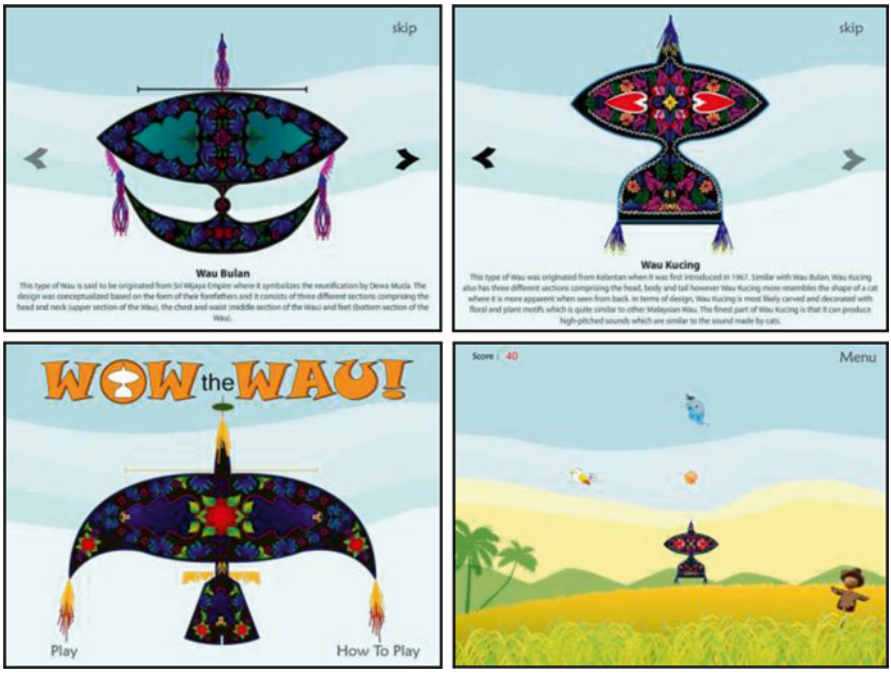

Fig. 25.1 Wow the Wau! game screen captures

very minimal information about traditional Wau game. With its new face in the computer digital game format, everything is possible to promote and introduce Wau as one of Malaysia's traditional games that we should be proud of. This study significantly affirmed that computer game can be one of the platforms to create awareness, to inform, to educate, and to introduce locals on the background and types of Wau and at the same time can be a tool of entertainment in line with the transition of modern lifestyle of today.

The Development Process

Throughout the design process, the researcher has experienced and dealt with aspects to facilitate with the designed game. The figure shown below is the process involved throughout this research:

The design process shown in Fig. 25.2 is more emphasized on the iterative design process which a new version of the game is rapidly prototyped [17]. Besides that, the designed game also had been play tested, evaluated, and refined in order to meet

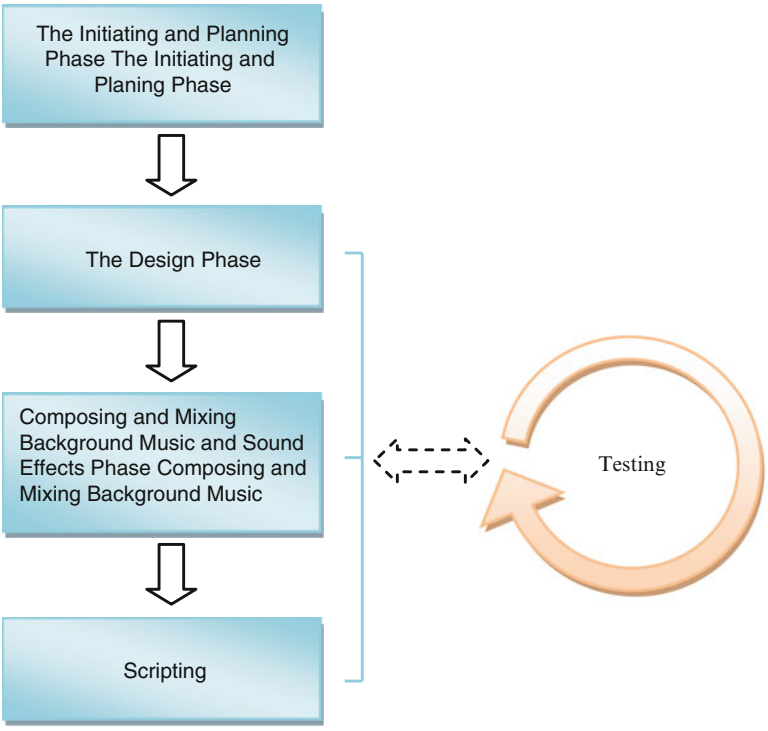

Fig. 25.2 The development process

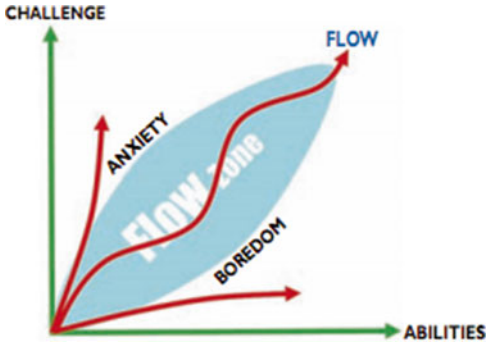

Fig. 25.3 The game flow diagram based on Mihaly Csikszentmihalyi theory

the main goals of the designed game. It was proven that throughout the iterative design processes, the designed game is able to accomplish its design goals where the game can be used as an educational tool to educate people on the background of the Malaysian traditional game Wau.

The Game Flow

In any game development, the flow of the game is very important as it is capable to motivate players to complete the game levels. As for the designed game, it was a success based on the responses and feedbacks received from the testing phases. The difficulty of both levels set in the game is in line with the flow state based on the Mihaly Csikszentmihalyi theory which involved competition, chance, or any other dimensions of experience. It provided a sense of discovery, a creative feeling of transporting the person into a new reality by allowing the person to reach higher levels of performance, and led to previously undreamed-of states of consciousness [18]. The theory applied is essential in making certain that the game is able to provide a smooth experience and flow for the players to complete the game with a high level of enjoyment and fulfillment (Fig. 25.3).

25.4 Conclusion

This study has contributed toward a new finding where traditional game *Wau* can be accepted in a form of computer digital game. Information and knowledge of the *Wau* background and myths can be learned from the designed game and basically has successfully become a tool to sustain and preserve the unique and interesting values of *Wau* itself. In a nutshell, the execution of this study is believed to be an action plan to educate and to promote the existence of *Wau* locally and also to ensure its continuation to be kept alive in a variety of platforms in order to preserve the value and its identity. Hence, it will be an honor if this study could assist future

research in any field related to Malaysian traditional games especially *Wau*. As the study of this research has been successfully conducted, it is recommended that further research can be conducted by having the traditional game *Wau* in other platforms such as mobile and console game. Besides that, the research could also embark on designing a digital game by having a different gameplay of *Wau* as this study showed that *Wau* came from a different background and has its own identity. Thus, the idea would be a great milestone in preserving and introducing *Wau* as a Malaysian icon locally and globally.

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Chapter 26
Role of Mobile Web-Based Technology Toward Online Grocery Shopping in Malaysia

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Abstract As being one of the expeditious embryonic countries, Malaysia is considered as a nation with high velocity of citizens with professions. With a demanding lifestyle, many find it hard to make time for, what once was a regular routine, grocery shopping. Due to that, online grocery shopping was introduced. Mobile online grocery shopping is an evolution of online shopping. Thus, both qualitative and quantitative studies were carried out to find a way to enhance consumer shopping experience. This paper explored a method to boost online shopping through mobile technology.

Keywords Mobile technology • Online shopping • Grocery shopping • Motivation • Engagement

26.1 Introduction

Malaysia's young adults are predominantly having careers; they need to create time just for grocery shopping either after work or during weekends. With that, it interferes their leisure time with family or friends. Malaysia is proved to be an emerging Asian economy and has the potential to be advance in technology-driven and high-tech production-based development system [1]. Young adults are believed to have very limited time in their daily life and spend most of their time at work. They confess that it is the biggest regret that they have because it affects their children's early years [2]. Along with that, it is found that online shopping is seen as an opportunity to boost local grocery market. Customers prefer online

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shopping because it saves their valuable time. Therefore, mobile online grocery shopping would be even more beneficial for both consumers and marketers. Consumers could do the shopping whenever they prefer because it is accessible at anytime and anywhere. It is also advantageous for the marketers because they could expand their market without increasing the amount of their branches. Even though online shopping is very common in Western countries, this method nevertheless is still new in Malaysia [3]. With online grocery shopping, customers would be able to place their orders while they are working and receive their orders accordingly. This would create a fast speed of time for them to shop for grocery [4, 5]. It is believed that the role of mobile advertising especially the website accommodates the significance of customers to purchase grocery independently. They can shop and put into cart via technology online in the website and choose time and date from work. With this study, hypermarkets in Malaysia could adapt and explore the new way of shopping to make it easier for customers to purchase grocery.

26.2 Review of Related Research

In 2010, RM1.8 billion was spent for shopping via the Internet in Malaysia. It is expected that the figure will increase almost triple in three years. Service provider PayPal found that Malaysians tend to spend more of their expanses on local online shopping websites with up to RM825 million transactions in 2009. Comparing to foreign online shopping websites, it is recorded that only RM627 million was spent on them. The research also had discovered that the potential of growth in mobile online shopping is compelling [6, 7]. Most of the consumers are searching for a smooth-running method of shopping. Hence, customers demand their items instantly without minding about the price or quality; therefore, in this situation, online shopping should be taking into an important consideration [8]. Homeplus, South Korean Tesco branch, has found a new strategy to motivate their consumers to purchase their products with mobile phones. Tesco Homeplus provides enormous, rich images of food items and placed them in the same way as it is at the shop on the walls of train platform. While their consumers are waiting for the train to arrive, they could browse items on the walls. With QR barcode on every corresponding item, this will make it easier for the consumers to purchase. By doing this, Homeplus will not only create a new way of grocery shopping but also to keep the consumers engaged with them. By Olivia Solon, 30 June 11 [9]. Customers prefer shopping through online because it saves time. Overall, online shopping is the simplest method to purchase and obtain desired items [10]. Malaysians are one of the most active users in the context of smartphone users with the average of 6.4 h spent in a week purely on usage of data. Which means no phone calls or voice calls during these times. Malaysians spend about one hour per day on data with their smartphones. The top three activities that were used by them are Internet browsing, upgrading their current devices, and application usage [11].

26.3 Methodology

Theoretical Study

Statistics from existing research has been analyzed and synthesized. It is used to prove and give evidence for the project. In order to prove any facts, gathering statistics will be the valid way to do. Other than that, it is to establish cause and effect. Apart from that, literature review through books, articles, and the Internet was studied and used to sturdy up the project. This method was carried out to identify what has already been done according to the project. It is also to determine what are the key issues. Case study was done to analyze the existence of online shopping website. That includes literature reviews from studies and researches about existing websites.

Self-Administered Survey and Observation

The questionnaire was designed to provide a demographic profile for the research and also to obtain information on consumers' interest and preference. The questionnaire was given out to 150 random respondents at Giant Shah Alam. Self-administered questionnaire was given to customers at Giant Section 13 Shah Alam. The questionnaire was designed to extract information about young adults' behavior in Shah Alam. The observations were tape-recorded in order to analyze the consumers' interest, behavior, and response [10], which then recorded into the persona diagrams in order to obtain and apprehend the use of layouts by using 15 existing online shopping websites (local and international). Average findings of layouts and colors used in selected websites were carried out (Fig. 26.1).

Results

With the use of questionnaire assigned to Shah Alam residence, multiple charts had been constructed correspondently. The demographic profile of Shah Alam residence was acquired by the results.

Q1: How long does it take to do grocery shopping? (Fig. 26.2)

Most consumers in Shah Alam took less than 1 h to do their grocery shopping since they are racing against time. They tend to rush in everything in order to make way for their leisure time.

Q2: Which is the preferable method of claiming items? (Fig. 26.3)
Q3: Do you agree if minimal cost is charged for delivery service? (Figs. 26.4 and 26.5)

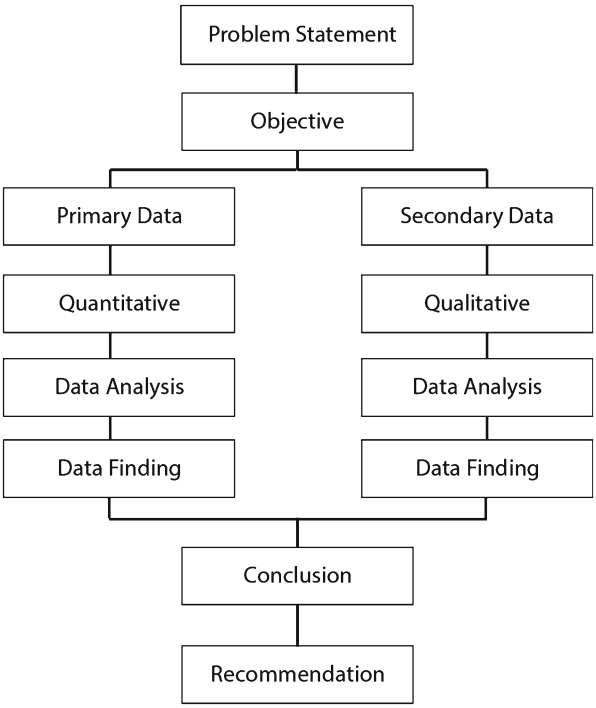

Fig. 26.1 Research framework on mobile grocery shopping

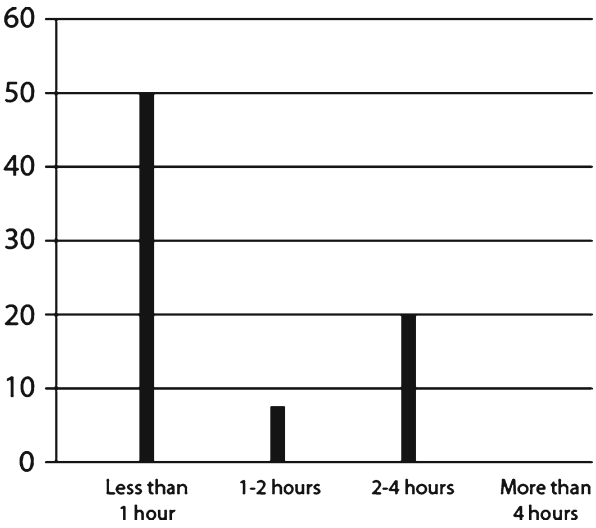

Fig. 26.2 Duration of grocery shopping

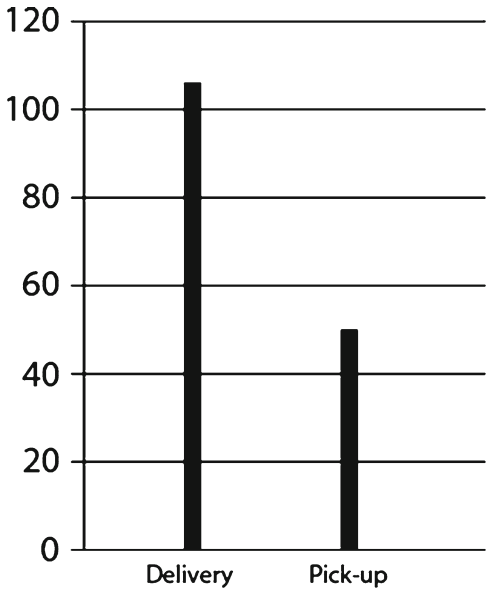

Fig. 26.3 Preference on claiming items

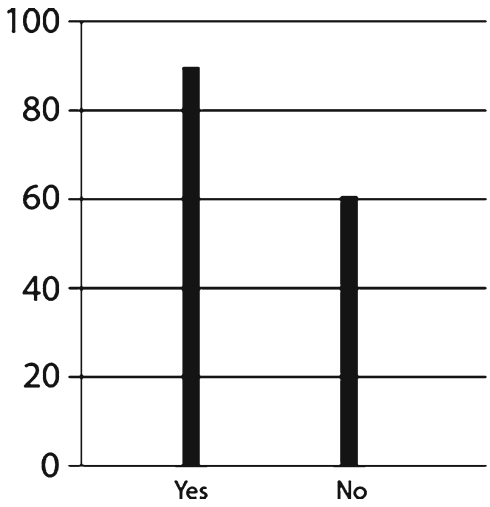

Fig. 26.4 Consumers' consent on minimal charge for delivery service

NO	Websites	Logo	Navigation	Masthead	Content	Image	Footer	Sidebar
1	Sun Jaya	2.07%	2.30%	28.57%	22.12%	21.16%	-	-
2	Deliver Eat	0.54%	2.34%	14.36%	23.85%	17.47%	-	-
3	Burger King	0.23%	2.07%	4.76%	47.47%	3.80%	-	10.71%
4	Domino's Pizza	0.38%	2.46%	7.37%	44.24%	7.14%	1.38%	-
5	Eat Now	6.99%	-	26.19%	39.17%	9.98%	-	-
6	Hungry House	0.77%	-	20.74%	27.65%	9.37%	-	-
7	McDonald's	0.15%	2.30%	9.22%	27.96%	6.95%	1.38%	4.84%
8	Pizza Hut	0.61%	-	11.52%	36.87%	12.02%	2.46%	-
9	KFC	0.38%	2.30%	5.76%	40.32%	30.30%	-	-
10	Pasta Mania	0.77%	1.50%	5.30%	29.15%	7.83%	-	2.16%
11	Azorias	1.54%	1.73%	5.18%	41.47%	7.49%	3.46%	-
12	Fashion Valet	0.84%	1.19%	8.33%	39.29%	5.24%	-	-
13	Zalora	0.61%	2.53%	5.07%	44.35%	4.15%	-	8.49%
14	eGarden	0.53%	3.07%	7.37%	39.32%	6.45%	-	-
15	Rakuten	0.50%	3.62%	3.51%	42.17%	5.45%	-	3.52%
Average		1.13%	1.83%	10.88%	36.36%	10.32%	0.72%	1.84%

Fig. 26.5 Layout average of selected online shopping websites

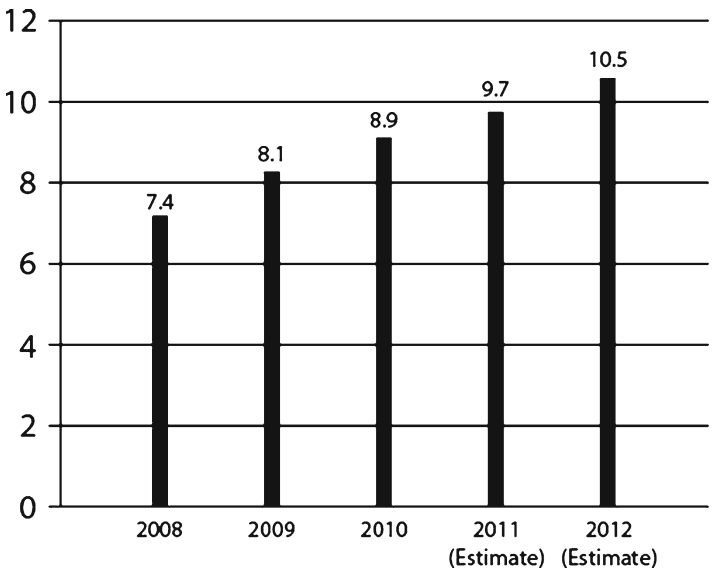

Fig. 26.6 Internet buyers (million) in Malaysia from 2008 to 2012

Calculating each category had been completed to acquire the average finding for website design. The entire numbers in one series had been summed up and divided by correspondent amount of website examples (Fig. 26.6).

As Malaysia is known as one of the developing countries, it is possible to change their way of shopping, which is through mobile web-based technology. It will not only be more convenient but also profitable for marketers throughout the country. Shifting to mobile web-based technology is rapidly escalating, along with the uprising of touch screen smartphones and tablet computers.

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Chapter 27
A Comparative Study of the Appreciation of Local Malaysian Culture in the Artworks of Ilse Noor and Tina Rimmer

Mohd Azhar Abd. Manan and Rosiah Md. Noor

Abstract Ilse Noor and Tina Rimmer are two well-known individuals in the list of female artists in Malaysia although both were foreigners. Tina Rimmer was a British who resided in Sabah since 1949, while Ilse Noor was a German national who is living in the Klang Valley since 1974. Tina was talented and skilled in figurative drawing despite not having a formal education in fine arts. She was a familiar face among art practitioners in Sabah since the 1950s till today. On the other hand, Ilse pursued graphic arts in the Academy of Fine Arts in Munich. Although both artists were from foreign lands, they produced artworks that depicted local Malaysian culture and life. They may have different observation methods, perceptions, compositions, and self-expressions, but through the medium of fine arts, both exhibited a unique style in appreciating and instilling the local culture of the society that they lived in. In this study, the what, how, and why are the research questions that required answers with respect to the subjects, forms, and content of selected artworks from both artists. Here, a comparative study using the content analysis method based on the art critique theory and organic unity model is applied as the research methodology. The findings of the study are hoped to contribute towards nurturing a love for the local culture among Malaysian societies as what have been upheld by these two female artists. In addition, the finding of the study is also viewed as an appreciation towards Malaysian female art creators who unfortunately have not been adequately promoted in the local art scene.

Keywords Visual art • Form and meaning • Local culture • Female artists

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27.1 Introduction

An artist creates visual artworks for a multitude of purposes. Among these is to express an emotion towards an object or event sparked by desire or an awareness learnt through experience. Another reason is to communicate an idea that represents a refined activity of the soul in trying to fulfill an aesthetic requirement, which is inherent in the need of humans in living life [1].

Whatever the reasons, the process of creating involves three main components that are subject, form, and meaning. The selection of the subject of creation may be based on the character of self-inquiry on something that is stimulating that concerns the wish to learn, understand, and appreciate. Consequently, the chosen subject is composed into a fine art form that contains meaning. This meaning can either merely satisfy the personal needs of the artist or expand to a desire to share it with the audience.

Both Ilse Noor and Tina Rimmer shared a common inspiration in choosing their subject that is the Malaysian local culture. They similarly chose to create using visual art. However, they differed in the art discipline in choice. Ilse is well known for using etchings, while Tina's main discipline is drawing, oil, and watercolor painting. Similarities and differences also exist in the meanings of their artworks in interpreting their love towards the local culture that is unlike their own original culture.

As mentioned above, what was the specific subject chosen, how it was composed, and why form the research questions in the study. Meanwhile, the main objective of the study is to analyze the artworks of Ilse Noor and Tina Rimmer who are two foreign artists that have decided to call Malaysia their home.

27.2 Literature Review

Fine Art

Fine art is one of the many forms of visual art, which traditionally comprised of drawing, painting, printing, and sculpture. A drawing is a product of the spontaneous effect done on a surface such as paper. Reference [2, 3] described drawing as an integration of various types of lines. Traditionally, the medium of drawing includes charcoal, pencil, pen, brush, and ink that will produce black markings with gray tones. Subsequently, colored drawing can be produced by using chalk, pastels, crayon, and water-based paints. On the other hand, paintings are usually produced using wet pigments such as oil paints, tempera, or acrylic with paintbrush by certain techniques peculiar to those media.

Prints are produced by transferring an image created on a surface called the "matrix" onto another surface usually paper using certain pressing techniques. Traditionally, printmaking is comprised of relief print, intaglio, lithography, and

screen painting that involve different skills [4]. Intaglio has its own uniqueness as it needs expensive equipments placed in a special studio. A type of intaglio printing called etching required the usage of metal plates as the "matrix" whereby the image is transferred onto paper using a particular type of rolling machine [5, 6].

Malaysian Female Artists

In the context of Malaysian art development, quite a number of female artists have been actively involved whether in solo exhibitions or in groups. Unfortunately, their art creations have not been satisfactorily acknowledged even today. If the collections in the Balai Seni Visual Negara (BSVN) are to be used as a standard, then the situation sadly reflects this state. It is noted that one of the functions of the BSVN is to collect artworks in order to preserve and expand the nation's cultural heritage. As at 2009, there were 3418 permanent collections of artworks in various forms [7]. However, since 1958 to 2009, only 199 art pieces in various forms that were produced by female artists have been kept as permanent collection in the BSVN. Out of these, 12 etchings by Ilse Noor were part of the permanent collection. Thus, it can be safely concluded that Ilse Noor is the only Malaysian female artist who has consistently used the acid etching print as the medium for her art.

In terms of the development of art in the state of Sabah, it is undeniable that female artists here are hardly recognized in the peninsula except Yee I-Lann as compared to the male artists such as Awang Damit Ahmad, Bayu Utomo Radjikin, and Kelvin Chap Kok Leong. The exposure of the works of Sabah's female artists may have only occurred in the *Saruk Kinabalu: Pameran Pelukis-Pelukis Sabah* in BSVN in 2005. In the exhibition eight female artists were featured including Tina Rimmer [8].

The Background of Ilse Noor

Ilse Noor was born in Wipperfuerth, West Germany, in 1941. At the age of 16, she had started to learn graphic art in Bonn and the College of Art in Cologne. Then, she furthered her study in the Academy of Fine Arts in Munich from 1963 to 1964. During the course of her study, she met her future husband who was from Malaysia. She later married him and moved to Malaysia in 1974 and stayed till today [9].

She was consistent in producing traditional print artworks using the technique of etching. She was actively involved in local and international exhibitions whether as a soloist or in groups throughout her career. Her creations always displayed works that revolved around the beauty and uniqueness of the Malay culture in Malaysia. All her artworks exhibited her appreciation towards nature that is filled with orderliness and harmonious designs as well as the attention to details and its application into poetry and music in the Malay culture [9].

The fineness and diligence in the aspect of technique together with the imagination of Ilse Noor were composed and expressed in an accomplished manner in contrast to the way print was made in her native country where the production technique and image composition were rough [10].

The Background of Tina Rimmer

Tina Rimmer was born in Dover, England, in 1917. In 1949, she arrived in Sabah to serve the North Borneo Government in Jesselton as an education officer (interview, 20 December, 2008). She began became involved in art exhibitions in Sabah since the 1950s. In the beginning, she joined hosting painting activities in the houses of British expatriates in Jesselton. She retired from public service in 1974. A year later she moved to Tamparuli where her painting activities began in earnest. She kept a schedule and painted the local goings-on in Tamu Tamparuli every Wednesday [11].

The activities in the Tamu became the main theme in the drawings and paintings of Tina Rimmer. Sketches of human figures depicting business activities as well as portraits were successfully recorded through direct observation [12]. Her works were first exhibited in Sabah Museum in 1978. She followed with solo exhibitions in 1984 and 1985. Since the 1950s she had made more that 900 paintings/drawing depicting the activities of Sabah communities. This was one of the ways for her to understand and appreciate the local culture so much so that she was not interested to return to her country of birth. As a result, she is considered as a reporter of sorts who recorded the lives of the common people around her. In all regards, she is also considered to play a major role in the development of art in Sabah [13].

27.3 Methodology

Content analysis is the method applied in the process of analyzing Ilse Noor and Tina Rimmer's artworks in order to explicate the similarities and differences of subject, form, and content. The comparison of their artworks is guided by the model of organic unity as recommended by Ocvirk, Stinson, Wigg, Bone, and Cayton [14]. This model is used as the basis for analyzing fine art in an orderly and detailed fashion. This enabled a systematic approach in the process of understanding an artwork. Organic unity is composed of three divisions that are subject, form, and content. The arrangement of organic unity forms a unity that is alive and dynamic.

The selection of artworks to be analyzed is based on observation and the support of secondary data on the priority requirement that the selection will represent a group theme or a particular series of works. Specifically, five art pieces from each artist were chosen as samples for analysis. In the meantime, other artworks in the same group's theme or series are observed in a generalized manner because of the similar or almost similar subjects and compositions. The chosen artworks of Ilse

Noor represent different series of her works that are the *Samudra*, *Irama Samudera*, and *Warisan Nusa*. Meanwhile, art pieces of Tina Rimmer chosen represent the location and time of the paintings that is in Tamu Tamparuli in the decades of the 1970s and 1980s.

27.4 Finding and Discussion

Subject

Ilse Noor – The creative works in the *Samudra* (ocean) series produced between 1998 and 2002 showed maritime subject such as a variety of shell life forms, shrimps, and pearls as well as sea froths. Similarly, in the *Irama Samudera* (rhythm of the ocean) series produced in 2006, the subjects of frog, traditional Malay music instruments, pearls, and froths were included in the landscape depicting sea life. However, in the *Warisan Nusa* (national heritage) series produced in 1986–1987, she chose traditional heritage buildings such as houses, palaces, and mosques as the subjects of her paintings.

Tina Rimmer – Almost all of the paintings and drawings made by Tina Rimmer depicted figurative subjects, especially human figures doing daily activities or posed in portrait. Most of her favorite subjects were recorded in paintings during her regular visits to the *Tamu*, which was the Sabahan's bazaar in Tamu Tamparuli during the 1970s and 1980s. She will sit there with her drawing materials and tools and record the various activities of traders and their wares, customers, and visitors as well as their actions and styles according to her observation.

Form

Ilse Noor – The subjects were used to form an image by using very expressive lines in all her print works. They were resolved with a high degree of fineness and detailing using the techniques of etching and aquatint. By applying the principle and elements of design, the overall composition was presented in an attractive manner to illustrate the captivating rhythms of *gamelan* and *keroncong* music in the *Samudra* and *Irama Samudera* series. The repetition of subjects, economical usage of colors, and a balanced shallow space created harmony in the overall picture. Meanwhile, in the *Warisan Nusa* series, the elements of emphasis were placed on the traditional buildings accompanied by light effects contrasted by shadows to enliven the ambiance of the buildings.

Tina Rimmer – Her artworks were drawings and paintings that were produced using conventional methods. A major portion of her works comprised of spontaneous paintings that were inspired by direct observation of her subjects. The drawings

were mostly done with haste, simple and bold because she had tried to record subjects that were mobile. Nevertheless, her sharp perception was able to capture the structure and gesture of the subject. The resultant drawings showed the depth of her perception and her skill in applying the various media that she usually used such as pencil, charcoal, pastel, ink, and water color. In terms of drawing technique, she stressed on the value of form by using various qualities of lines, tones, and shadows to depict the subject realistically. On the other hand, her oil paintings were produced in a more planned and controlled manner. The paintings were made based on the drawings and sketches that were done "live."

Content

Ilse Noor – Ilse Noor, via the *Samudra* series, declared that the Malays are a race of seafaring people whereby the shrimps projected in her paintings symbolized the caricature of real people (Fig. 27.1) (*Berjoget* – dancing). The image was displayed in a ***joyful*** mood to delight the audience of her artworks. Her fascination with nature was illustrated as if people live in a mystical and beautiful world. She was also inspired by the traditional Malay folklores as well as traditional *gamelan* and *keroncong* music, which were visualized in this series. Various sizes and types of shells were composed to form serene and charming palaces similar to another art piece titled *Istana Puteri Sri Bunian* (The Palace of the Sri Bunian Princess) (Fig. 27.2).

She continued to show her enthrallment with Malay traditional music and her penchant to fantasies in the mythical realm in the *Irama Samudera* series. The paintings titled *Irama* vii (Fig. 27.3) and *Irama* viii (Fig. 27.4) exhibited cheerful atmospheres with animals such as frogs as subjects that were spellbound while playing the musical instruments while sea froths accompanied the rhythms of the song.

The paintings titled "Masjid Kampung Laut," "Kelantan (Fig. 27.5)," and "Balai Besar Kedah" (Fig. 27.6) formed part of the series of *Warisan Nusa*. These artworks showed her deep interest in traditional buildings that were visualized through the composition of differing qualities of lines and tonal values that reflected the high attributes of an aspect of Malay culture. Her appreciation towards Malay culture is clearly evident through art creations such as these. Not only that, she also wished that the Malay cultural heritage would be remembered by the next generations.

Tina Rimmer – Tina Rimmer composed her subjects to portray the real world. She used oil paint as the medium to illustrate the whole ambiance of the *Tamu* (Figs. 27.7 and 27.8) in order to portray the everyday life of the major portion of Sabahan community in the decades of the 1970s and 1980s.

The *Tamu* became the main "studio" for Tina Rimmer to create because that was where the various ethnic people who came from different parts of Sabah congregate to interact and socialize. There, Tina was able to learn and understand the culture, economy, and social behavior of the various communities in Sabah. According to her, at the *Tamu,* people from several tribes arrived from the deep interiors to rest (Fig. 27.9) after arranging their wares to sell and buying other things that they need.

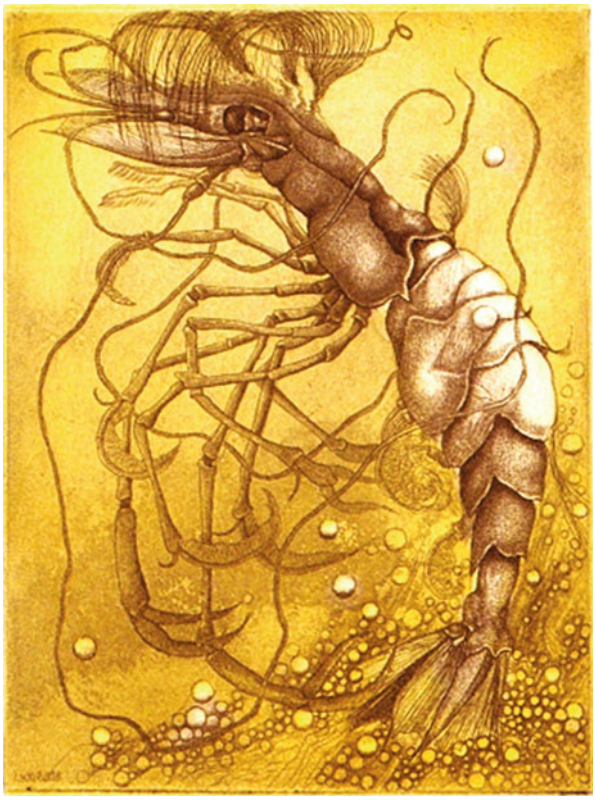

Fig. 27.1 Berjoget (1998)

Among the numerous goods displayed were traditional musical instruments (Fig. 27.10) and herbal medicines as well as massage services, magic shows, and other businesses that were conducted openly. All these inspired the artist to record the activities in her drawings.

In addition to the above, Tina's drawings and sketches also showed her research in learning the way of life of the various ethnicities in Sabah. She wanted to understand the way they carried their goods in *Wakid* baskets that were strapped to the back in a unique way (Fig. 27.11), the way they carried babies using cloths (Fig. 27.12), the different ways of wearing head covers among the various tribes (Fig. 27.13), and the manner of tying hair buns by women of different ethnicities (Fig. 27.14).

The drawing using pastels as medium in Fig. 27.15 was one of many that clearly showed the social behavior of Sabahan women circa 1983. It depicted three women conversing happily while relaxing and chewing betel nut concoction after the rigors of selling and buying. These women were the main subjects in the painting that represented the Sabahan society that coexisted harmoniously even though at a very moderate economic status.

Fig. 27.2 Istana Puteri Sri Bunian (2000)

27.5 Conclusion

The fine artworks of Ilse Noor and Tina Rimmer contained many similarities in manifesting their appreciation of the local culture reflecting the meanings of their works. Both chose the daily life and environment of the Malays and other ethnic groups as the subjects of their artworks. Although the particular subjects may differ, the way of applying those into the art pieces was unambiguous and realistic. Nevertheless, the composition of media and technique and the approach in the expression of ideas between the two were very different. This is probably due to their different backgrounds and art education.

Fig. 27.3 Irama vii (2006)

Ilse Noor who had received a formal education in art was skillful in the discipline of etching. She was successful in composing an ordinary surrounding into an interesting subject by using a dramatic and harmonious approach in relaying the message. Each image chosen represented a symbol of the local culture in order to infuse its unique aesthetic values. In terms of the leanings towards Malay literature and traditional music, she managed to induce the audience to share her poetic exploration into the world of fantasy and myths. Meanwhile, in the *Warisan Nusa* series, she focused on traditional buildings to show her appreciation on the heritage by using refined and detailed imagery.

This approach towards illustration has a similarity to Tina Rimmer's presentation in her drawings and paintings. The approach towards recording the activities, ambiance, and vista of real life had contributed greatly to the local socioeconomic history, particularly Sabah's. Although she did not formally studied art, Tina's talent in observing was her strength that enabled her to draw quickly and capture the subject spontaneously. She did not intend only to fulfill her own aesthetic needs but also to share her experiences in order to channel welfare contributions to the various ethnic groups in Sabah.

The art creations of these two women managed to evoke the issues of local culture according to their experience and showed their ability to use art to manifest their spiritual expressions. Their interest and diligence in conveying the meaning of the culture via the art forms have in fact raised the awareness and knowledge on the

Fig. 27.4 Irama viii (2006)

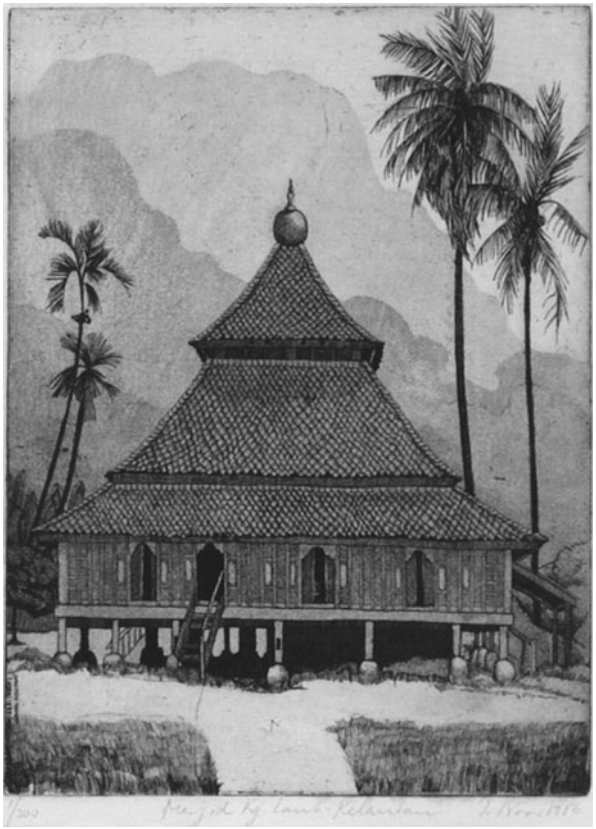

Fig. 27.5 Masjid Kg. Laut, Kelantan (1986)

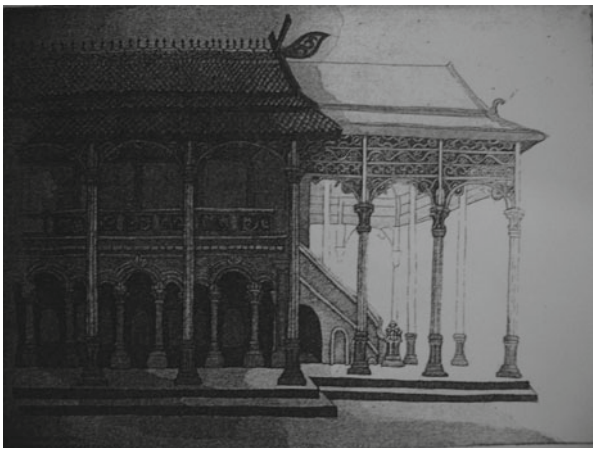

Fig. 27.6 Balai Besar, Kedah (1986)

Fig. 27.7 Penjual Tembakau dari Tamu Tamparuli (1997)

Fig. 27.8 Pemandangan di Tamu

Fig. 27.9 Relaxing after early exertion

Fig. 27.10 A man selling 'gong'

Fig. 27.11 Woman carrying a loaded 'wakid'

Fig. 27.12 Motherhood-women carrying her baby in a 'sarong' tied in a knot on the right shoulder

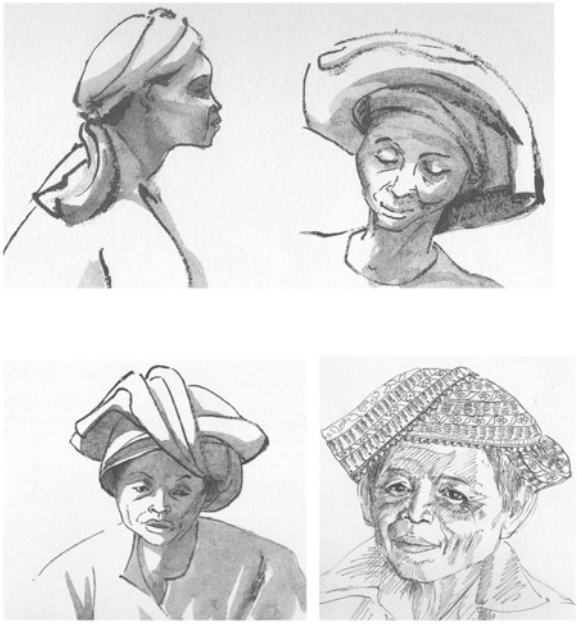

Fig. 27.13 Woman from Kota Belud and Bajau's women

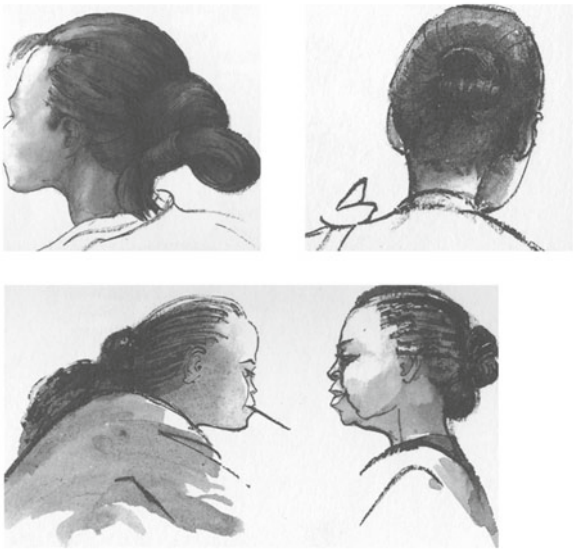

Fig. 27.14 Kadazan Dusun hair-knots (*top*), Bajau's hair-knots (*bottom*)

Fig. 27.15 Tiga Orang Wanita, Sirih, and Pinang (1983)

aesthetic values of local culture among the general society. On the whole, these two female artists through their self-expressions had contributed greatly towards the history of visual art development in Malaysia. They should be emulated especially by Malaysian artists who are born and raised locally.

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Chapter 28
Preservation Characteristics of Malay Garden: A Catalyst for Sustainable Cultural Landscape in Malaysia

Ahmad Zamil Zakaria, Ismail Hafiz Salleh, Siti Norlizaiha Harun, and Mohd Sabrizaa Abd. Rashid

Abstract Understanding of the Malay community in the past was too difficult to understand by the present generation. The easiest example, that be posted to us is whether the Malay Garden really exists, or earlier Malay only be regarded as a foolish people without knowledge. The purpose of this study is to highlight the characteristics of the Malay Garden that will be used as a concept in the development of the garden in Malaysia. The objectives are to introduce the characteristics of the Malay Garden to the public and to promote the concept of the Malay Garden as a catalyst in creating sustainable cultural landscapes in Malaysia by using the old manuscripts of the Malay community and old Malay film and doing a site visit to the traditional Malay house throughout the states of Peninsular Malaysia. Finally, the researchers believe that the Malay Garden really exists, and have interesting features, for us to highlight to the public.

Keywords Malay garden • Malay landscape • Malay garden concept • Malay • Cultural landscape

28.1 Introduction

The garden does not even have a complete design model if compared to the other garden concept such as Balinese garden, Japanese garden, and English garden. So what are the characteristics of the Malay Garden that researchers would like to highlight? To facilitate the understanding of all, the Malay Garden is not one of the

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popular garden concepts in the field of landscape architecture. The answer lies in the religion and culture of the Malays.

At present, if observed, Malays are a Muslim society. Even so, when referring to the Malay historical records, in ancient times their ancestors are said to have a religion other than Islam. This is because Islam is spread a little bit late to the Malay Archipelago, if to compare with Hinduism and Buddhism.

The Malay community in the past using their strength of culture and religion at the core of the garden development. It can be seen clearly when the influence of the Hindu religion is found in the Malay culture, even the Malay community has long embraced Islam. The Malay culture is basically gentle and well mannered, has high self-esteem, and has been combined with the belief in supernatural beings, medicinal values, and philosophical beauty. An advantage if the concept of the Malay Garden is adopted in landscape development in Malaysia is that the arts and culture of the Malay community will be promoted throughout the world.

Terminologies in the Field of Landscape Architecture

Before we go further to know what is the Malay Garden, it is better if we have an understanding of some of the terminologies used in the field of landscape architecture. These terminologies are representing all the special features available on the Malay Garden model design. All this terminology refers to the National Landscape Policy (NLP) to match the topic of sustainable cultural landscape [1].

- "Conservation" – Preservation, restoration, reconstruction, rehabilitation, and reconciliation or any of its affiliates. Conservation of a Malay Garden will make it a national treasure.
- "Preservation" – With the aim to preserve, treat, care of (the treatment and maintenance), and salvage something with the aim to stop the damage, decay, or dilapidated condition and provide a safe and solid structure. Preservation of national treasures will be one of the challenges because it requires high technical expertise and a relentless effort.
- "Sustainable" – Ability to maintain a good performance or achievements of all time. Making a sustainable landscape product can be achieved if the concepts used are oriented to the ecological based.
- "Heritage landscape" – A landscape that has a high value in terms of visual, scientific, cultural, and historical, resulting from the effects of previous community activities or occur naturally. Heritage for generations to come can be maintained up to the next generation if the previous community is sensitive to documentation and teaches all knowledge to their heirs.
- "Natural landscape" – A landscape formation occurs from natural processes. Natural landscapes are displayed by highlighting the natural elements that can be a trademark to a place.
- "Country landscape" – Rural landscape or a low-density area. It is usually based on the environment that is influenced by socioeconomic activities and local

culture. Most of the remains of the Malay Garden are currently available in rural areas (traditional house), because the landscape that existed is a legacy of previous generations.

The Cultural Landscape

People are doing various activities on the physical environment to meet their needs. These changes occur not allow the cultural landscape that formed in ancient times has been in existence at this time. As in [2], The World Heritage Committee has identified and adopted three categories of cultural landscape which are:

- "A landscape designed and created intentionally by man"
- An "organically evolved landscape" which may be a "relict (or fossil) landscape" or a "continuing landscape"
- An "associative cultural landscape" which may be valued because of the "religious, artistic, or cultural associations of the natural element"

Reference [3], groups of people alter the landscape in particular ways at different times in different places. Consequently, a distinctive cultural landscape results from three types of differences as follows:

- Differences among groups of people
- Differences in the time period when people undertake activities
- Differences among areas of the Earth's surface

As in [4], the cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural are the medium, and the cultural landscape is the result.

National Landscape Policy

There are two strategies in the National Landscape Policy which can be used as reference in establishing the Malay Garden in landscape development [1]. The strategies are the following:

- Strategy 4.2 – Identify and develop the landscape of high value in terms of visual or culture.
- Strategy 4.4 – Preserving the landscape that has high heritage value as national assets.

All parties who are involved and engaged in the field of landscape architecture today, such as landscape architect, park managers, and planting nursery operators, need to increase knowledge and skills to face new challenges as well as to advance in the field of landscape architecture in Malaysia today. The new idea is to create an attractive landscape besides introducing local arts and cultural uniqueness.

At present, we have directed at creating a quality living environment and sustainable development for all segments of society in line with Vision 2020. This was seen as a noble effort in line with government requirements to drive the industry of landscape architecture to a higher level and thus to have the ability to promote the beauty of the landscape in Malaysia to other countries. It can provide benefits to consumers and the nation through higher economic returns and contribute in improving the quality of landscape development in the country. All parties involved are urged to be more persistent and constantly work to develop the landscape industry by diversifying and increasing the production of hard landscape elements and introduced local plant species in landscape development in Malaysia.

Implementing agencies involved in the realization of the strategy are the National Landscape Department (JLN), the State Authority (PBN), the Local Authority (PBT), the Department of Town and Country Planning (JPBD), the Ministry of Agriculture and Agro-Based Industry (MOA), the Ministry of Tourism and Culture (KPKM), the Ministry of Rural and Regional Development (KKLBW), and the Department of Agriculture (DOA).

28.2 Methods

A Malay Garden concept also requires the same elements as the concepts of the other garden, such as soft landscape elements, hard landscape elements, placement, function, and creative arrangements (design principles). However, in the case of the concept of the Malay Garden at present, it is still not clear if all things are related to design principles. The positive side of this concept is the philosophy of the function and placement of an element that is very clear; it represents the Malay culture in ancient times.

In this study, researchers reviewed seven old Malay manuscripts to get a list of soft landscape elements and hard landscape elements which are listed in each manuscript with their species, functions, and placement. The manuscripts are Bustan al-Salatin (The Garden of Kings) [5, 6], Tale of Abdullah [7, 8], Tale of Hang Tuah [9], Tale of Inderaputera [10], Tale of Merong Mahawangsa [11], Sulalatus al-Salatin (Malay Annals) [12], and Traditional Malay Medicine [13]. Refer to Table 28.1 and Table 28.2.

This research also uses Malay films as a medium of information prior Malay ways of life. There are three categories of film used in this research:

- The first category is the Malay film published in early 1956–1972.
- The second category is the old Malay film that portrays life in the palace in the olden days.
- The third is the modern Malay film depicting the old Malay lifestyles.

The researcher strongly believes that every producer and film director will do a little research about the old Malay community before producing a film. By using the old Malay movies, researchers will identify from the using of the ancient prop to

Table 28.1 List of landscape furniture observed by the author and recorded in the research papers done by researchers in the past about the Malay garden in the Malay archipelago [14]

No.	Local Name (As be called by local people)	English name
1.	Ampaian	Suspension
2.	Bangsal/ Sulap	Barn
3.	Buaian	Tree swings
4.	Gerbang	Arch
5.	Guri	Guri (smaller than common traditional Malay water vessel)
6.	Jamban / Tandas	Latrine
7.	Jamung andang / Kandil	Torch
8.	Kepok padi / Jelapang	Paddy store
9.	Kolah	Water tank
10.	Kolam	Pond
11.	Pagar	Fence
12.	Pangkin	Resting hut (usually without shelter)
13.	Pasu bunga	Flower pot
14.	Planter	Open timber platform (usually for washing clothes)
15.	Perigi	Well
16.	Perun	Dump site
17.	Reban	Hen coop
18.	Tempayan	Water vessel
19.	Titi	Log bridge (usually made from Areca nut trunk)
20.	Wakaf	Gazebo

Table 28.2 List of the most often cited plant species in the old Malay manuscripts [15]

	Plants Species		
No.	**Local Name (as it seems in the manuscript)**	**Botanical Name**	**Description**
1.	Bunga gandasuli/gandasuli	Hedychium coronarium	4 (BaS, TOHT, SaS, TMM)
2.	Kelapa/bunga kelapa/nyiur/nyior	Cocos nucifera	5 (BaS, TOA, TOHT, TOI, TOMM)
3.	Bunga delima/bunga delima wanta/delima	Punica granatum	6 (Bas, TOHT, TOI, TOMM, SaS, TMM)
4.	Pinang	Areca catechu	5 (BaS, TOA, TOHT, TOI, TOMM)
5.	Langsat	Lansium domesticum	4 (BaS, TOA, TOHT, TMM)
6.	Anggur	Vitis spp.	4 (BaS, TOA, TOHT, TOI)
7.	Gaharu	Aquilaria malaccensis	4 (BaS, TOA, TOI, TMM)

Legend, 1. Bustan al-Salatin (The Garden of Kings) (bas), 2. Tale of Abdullah (toa), 3.Tale of Hang Tuah (toht), 4. Tale of Inderaputera (toi), 5. Tale of Merong Mahawangsa (tomm), 6. Sulalatus al-Salatin (Malay Annals) (sas), 7. Traditional Malay Medicine (tmm)

Table 28.3 List of landscape furniture observed by the author from the Malay films [16]

No.	Types of Landscape Furniture (as it appears in the film) / Malay Films	Ampaian (Suspension)	Bangsal / Sulap (Barn)	Buaian (Tree swing)	Gerbang (Arch)	Guri	Jamban / Tandas (Latrine)	Jamung andang / kandil	Kolam (Pond)	Pagar (Fence)	Pangkin	Pasu (Flower pot)	Pelantar	Perigi (Well)	Perun / perunan (Dump site)	Reban (Hen coop)	Tempayan (Water vessel)	Titi	Wakaf (Gazebo)
1.	Hang Tuah (1956)				x			x	x	x		x							
2.	Pendekar Bujang Lapok (1959)	x			x					x		x		x	x				
3.	Batu Belah Batu Bertangkup (1959)					x	x	x	x	x		x				x	x		x
4.	Nujum Pak Belalang (1959)	x				x	x	x	x	x	x	x		x		x			
5.	Bawang Puteh Bawang Merah (1959)	x	x	x		x	x			x	x			x			x		
6.	Seniman Bujang Lapok (1961)						x			x	x	x		x			x		
7.	Ahmad Albab (1968)					x				x		x					x		
8.	Laksamana Do Re Mi (1972)					x				x							x		
9.	Puteri Gunung Ledang (2004)				x			x		x				x			x		x
10.	Magika (2010)	x		x	x	x		x	x	x		x		x			x	x	
11.	Hikayat Merong Mahawangsa (2011)				x	x		x		x	x		x				x	x	

give a little info about the lifestyle of the Malay community (refer to Table 28.3 and Table 28.4). The other methods are a site visit to the traditional Malay house throughout the states of Peninsular Malaysia.

28.3 Result and Discussion

The field of study is the Malay garden design concept, and the subject investigated is the landscape elements which are hard landscape elements and soft landscape elements as well as architectural order as manifested in the selected houses based on their state from the observation and site visit. The design form and architectural order emphasis are in the physical body of the building, the conventions that give the buildings their form, and the compound of the garden itself.

The Strength of Soft Landscape Elements and Hard Landscape Elements for the Concept of Malay Garden Design Model

Through the observation, there are some differences in the concept of the Malay community garden, in terms of geographical aspects, cultural of societal aspects, and terrain aspects.

Table 28.4 Among the plant species founded from the Malay films [16]

Plants Species / Malay Films			Hang Tuah (1956)	Pendekar Bujang Lapok (1959)	Batu Belah Batu Bertangkup (1959)	Nujum Pak Belalang (1959)	Bawang Puteh Bawang Merah (1959)	Seniman Bujang Lapok (1961)	Ahmad Albab (1968)	Laksamana Do Re Mi (1972)	Puteri Gunung Ledang (2004)	Magika (2010)	Hikayat Merong Mahawangsa (2011)
No.	***Local Name***	***Botanical Name***											
1.	Andung merah	*Cordyline fruticosa spp.*		x		x		x	x			x	
2.	Buluh / bunga buluh gading / rebung	*Bambusa vulgaris*		x	x		x		x	x	x	x	x
3.	Buluh perindu	*Bambusa magica*		x	x		x		x	x	x		
4.	Kelapa / bunga kelapa / nyiur / nyior	*Cocos nucifera*	x	x	x	x	x	x	x		x	x	x
5.	Pinang	*Areca catechu*	x	x	x	x			x		x		x
6.	Sirih	*Piper betle*	x	x	x		x				x		
7.	Pisang	*Musa spp.*	x	x	x	x	x	x	x	x	x	x	x
8.	Nipah	*Nypa fruticans*	x	x	x	x	x		x		x	x	x

There are differences in terms of visible geographic distribution zones in Peninsular Malaysia, divided into four, which are the Northern zone (Perlis, Kedah, and Penang), the Middle zone (Perak, Selangor, and Kuala Lumpur), the Southern zone (Negeri Sembilan, Melaka, and Johor), and the Eastern zone (Kelantan, Terengganu, and Pahang). It shows that culture has played an important role in the design and arrangement of a garden and its elements in the Malay community (refer to Figs. 28.1, 28.2, 28.3, and 28.4).

The potentials of the soft landscape elements that can be used to develop the concept of the Malay Garden design model are as follows:

- All the plants mentioned in the manuscripts are composed of tropical plants.
- The plants are still used by the Malay community at the present time, but do not impose any concept in terms of planting design.
- The Malay society strongly believes in the use of certain plants for medicinal purposes, especially the group of herb plant.
- The high aesthetic value of plants (multifunction, e.g., aesthetic purposes, aromatic, and medicines).
- There are many options of plants that can be recommended for yard landscaping, open spaces, and institutions to adopt the Malay Garden concept.

The development of technology and knowledge among the Malay race allows them to constantly maintain all these hard landscape elements which were revealed by their ancestors. From a list of hard landscape elements that is found in old manuscripts, not all of these elements are for decorative or aesthetic purpose only. Most of them are multipurpose used and obviously built for the ascertaining function base for their everyday life activities and its surrounding. This has proved that the Malay community in the past not only chooses the landscape furniture for purely aesthetic purposes, but it has included their functions and use.

Fig. 28.1 (**a**, **b**) Shown are the architectural landscape elements and the concept of the Malay community garden at the Northern zone, Kg. Jalan Bahru, Balik Pulau, Penang (Source: Author, 2013)

Fig. 28.2 (**a**, **b**) Shown are the architectural landscape elements and the concept of the Malay community garden at the Middle zone, Kg. Repoh, Batu Kurau, Perak (Source: Author, 2013)

Fig. 28.3 (**a**, **b**) Shown are the architectural landscape elements and the concept of the Malay community garden at the Southern zone, Kg. Tanjong Penajis, Rembau, Negeri Sembilan (Source: Author, 2013)

Fig. 28.4 (**a**, **b**) Shown are the architectural landscape elements and the concept of the Malay community garden at the Eastern zone, Kg. Berembang, Kuala Lipis, Pahang (Source: Author, 2013)

Beginning with the search for Malay garden landscape character, researchers have found that there are influences in the design of the park in the past and the present. After that, the landscape elements surrounding the house compound of the Malay community have been identified and will be used in the concept of the Malay Garden design model.

Information on the characteristics, influence, elements, and compounds mentioned are taken from old manuscripts, old Malay films, and also observations at the study site. The next phase of research is the investigation process, a process in which researchers look for similar elements found in soft landscape elements and hard landscape elements, which arise from three main references used in this research. As a result of the processes of research conducted, researchers have been able to find function, potential, marketability, and sustainable design which are available in the Malay garden design. In addition, it becomes advantageous to the Malay garden to be promoted to the public. Researchers have gained a good Malay garden design model, and it is the result of the process of research that has been conducted before. Function and arrangement of soft landscape elements and hard landscape elements will be issued to be the guidelines for the construction of Malay garden design model in the future (refer to Fig. 28.5).

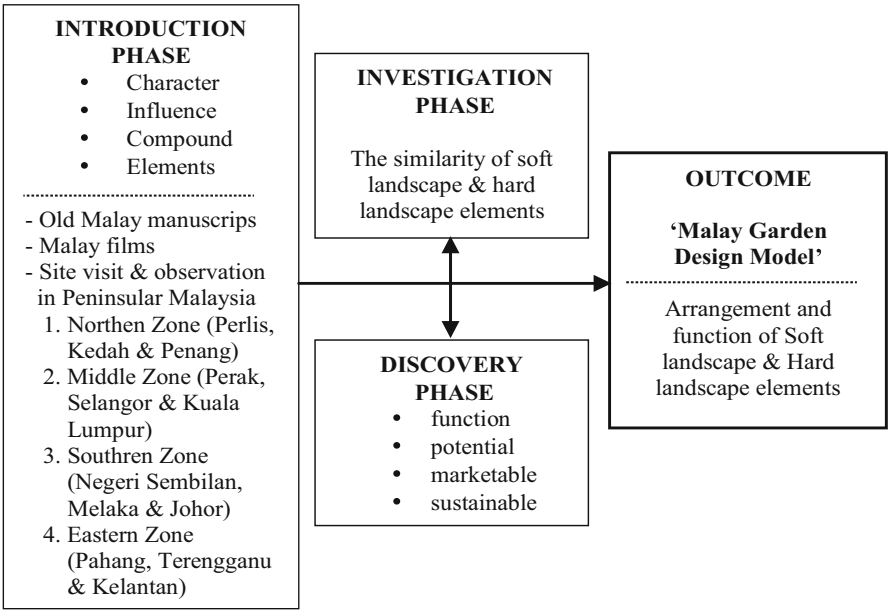

Fig. 28.5 Phase and involvements of the development of Malay garden design model

28.4 Conclusion

Tun Seri Lanang who wrote *The Malay Annals* agreed that the Malay language was the regional lingua franca, a language of trade and trades, as also confirmed by the Portuguese Tome Pires through his book *Suma Oriental*. Malay people are a special race, and there are many interesting elements through their creativity, such as *songket* weaving, carving, matting handicrafts, and architecture that may be highlighted to become a model for the design of a Malay Garden. Finally, it will foster the Malay community to be proud of their own race.

The history of Malacca recorded that the Malays are a superior race and are able to create an international maritime trade center known throughout the world. Malay people are very much the philosophies that can be translated in every element of landscape design. However, the main problem is not the philosophy of the Malays and the elements. The main problem of the Malays is that they are too humble and do not even know that there is potential. Potentials of each plant and hard landscape elements should be more highlighted, so that it is easily commercialized and eventually will be a source of income to the Malaysian society as a result of the sale of the plants and landscape furniture. Hence, it is also expected to increase the number of tourists as well as being an asset and identity of the Malay community.

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Chapter 29
The Exploration Technique of Nature for Contemporary Batik Design

M.F. Noorizan, Ishak Ramli, and Norwani Md. Nawawi

Abstract This research paper is about finding the new tools or materials in making batik which is using nature resources as tools. This research will expose the combination of both practice studio-based and historical research-type methods. Based on the explorations, the finding lines which can be a new creation in textile design. The outcome from this research purposely will be implemented in the textile industry as a new methodology of batik design. The exploration also shall be a guideline to batik makers and at the same time also can be implemented as a learning process in academic institutions.

Keywords Batik • Explorations • Malaysia

29.1 Introduction

In batik production, through research and development, we have the ability to find new application for the alternative method of production and process which is using nature tools to make batik design. Normally we just heard about a concept which has been always implementing batik design, but the use of nature tools itself is something different. Based on the current situation, people now should find a new method on how to improve the design of Malaysian batik locally. The process to create batik clearly is not only referring to traditional process, but it is also consuming technology, dyeing, printing, and finishing. Specific groups like batik makers,

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batik designers, batik entrepreneurs, and responsible batik persons should study and find out how to make our Malaysian batik not only become stronger in concept but also acceptable and marketable at higher international level. Regarding the statement by Puan Sri Noorainee Abdul Rahman, wife of Deputy Prime Minister:

> Pada era teknologi kini, pereka batik boleh memperolehi ilham dan ispirasi daripada banyak sumber bagi mempelbagaikan koleksi rekaan batik yang lebih menarik dan terkini. [1]

The above statement mentioned about how a head person thinks about batik design which not only requires changes to become something as conversional. To make up this to another level, the batik ideas and inspirations can be obtained using resources such as photo document, Internet, magazines, as well as various other sources.

Nature is the most influential resource in Malaysian batik. The shape of batik motif is divided into geometric and organic. The organic motif is influenced by nature such as "awanlarat" plan, floral, and also animals [2]. Transformation of creating a batik design is something positive in effort to upgrade the level to the international batik scene. Locally, fashion designers are individuals who can be considered as important to realize the expectations to show the batik product to international viewers as example. Through fashion brands, people will know batik is able to compete and be known along with its status with other fabric. To put into the standard, ideation of new batik should be suitable with mark needed. Giorgio Armani, known as an international designer, said: Bottom of Form

> European designers were impressed with the elaborated patterns and design and want to explore the potential of unveiling haute couture using batik and songket. [3]

Literature Review

Overview of Batik

Batik history has been long classified beginning mostly in Southeast Asia. Beginning from the prehistoric time, started using dried leaves as a base of cloth in dress has slowly changed to use fabric. Nakula said that early existence of batik in our society was likely because of the influence of colonialism and illegal trading activities in countries such as Rome, China, and Egypt thousands of years ago that brought the idea in production of batik [4]. The theory started that batik is an explosion resulting from external influences that have come to Malaysia before.

In addition, the theory also believed that the Malay community themselves have a talent or skill to make the batik without accepting other influences. This batik making culture is inspired from The Creator. From the statement that means local people already have their own creativity to explore something new such as batik making. The religion also adapts on the mind because each inspiration comes from the Mighty of Creator [5].

History of Batik in Malaysia

Early batik production based in Java Island, the production of batik has been stated and growth with influence of Islam and also has grown to the government and other kings [6].

Based on the documentation, the early history of batik has started in Indonesia and then spread to our country. For the beginning of Malaysian states in the East Coast, the earliest starting is unmentioned because of the limited historical documentation. According to Nakula, the writings on the history and information about batik industry in Malaysia mostly come from Haji Ishak bin Haji Che Su in Kota Bharu in 1911 [7].

If referring to a discussion about batik development in Malaysia, it is difficult to know when the early stage has started. The researchers mostly could not find the old early batik collections. The development process of batik Malaysia began from the tie and dye technique purposely for *ikatcelup* at that time. Before the wax been used, *kain batik pelangi* is an earlier fabric before using technique of *kaindasarberikat* which is both design and effect were created on the fabric surface using several colors. This technique is influenced by India and China [8].

Batik production in Malaysia was started with a production of batik stamps known as block batik. At this stage, the design was focused on the floral motif, and some other parts of the motif are influenced by India. A "crack" technique was produced to make a difference compared to Javanese batik [9]. Engraving skills in a local community developed efforts for the early stage of the resulting using wooden block. By the year 1920, batik using screen has been introduced together with the development of batik stamp.

The states of Kelantan and Terengganu are distinctively associated with batik and have been producing good quality batik. Malaysian batik has different approaches on the designs of the batik motifs compared to Indonesian batik. The usage of vibrant colors and larger and bold motif has been applied due to rapid changes in our local industry to suit the demands. The main method of batik in Malaysia is using "chanting" or "batik tulis," block, and silk screen. The basic tools in order to make batik are wax, cloth, batik frame, dyestuff, water, brushes, fixer (sodium silicate), and soda ash.

29.2 Research Methodology

As a start, the researcher will use two methods in collecting and defining data. They are historical research and studio-based practice research. Both of the methods will help to collect the data for the research purpose. Based on these two methodologies, the researcher will combine both methods to complete the research. These two methods will adapt into the research process to understand the flow of the research properly. The chat below shows how the methodology functions in order to collect data for this research (Fig. 29.1).

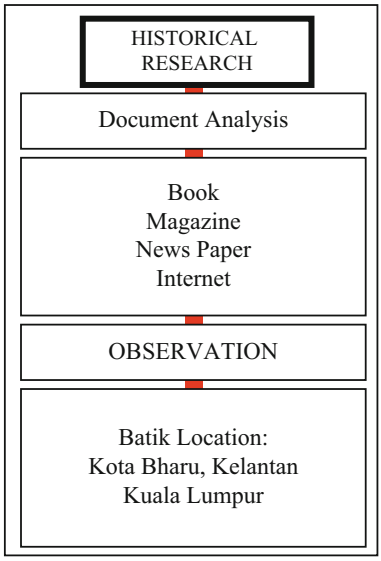


Fig. 29.1 Diagram of methodology

Over View Historical Research

Document Analysis

The term "document" refers to an official paper or book that gives information about a topic or some written work that can be used as evidence. Meanwhile the term "analysis" means a detailed study or examination of something in order to understand it (Oxford Dictionary; by A. S. Hornby; 2000). In this research, the researcher will collect all the data and analyze it based on the research topic.

Book

Books are such a big important reference in carrying out this study. Sources and information from the book can help this research to find out the information needed. The necessary information from the book references sometimes are difficult to get from it. However, reference from the books is a great resource to get the confirmed information needed.

Magazine

Adapting from the resources of books, a magazine is another source in getting the information. Magazines can be a source to support the information because there are articles that lead to a particular topic and it is easy to understand. In producing

this research, the magazine also contributed to the collection of data and information needed.

Newspaper

Newspaper is another reading material that also can aid to ensure the success of this research. The information that is needed is mostly definitive and can convey information effectively for the purpose of this research.

Internet

The last source of reading materials is surfing through the Internet. Surfing the Internet is not preferable, but still it is valid to use. The purpose of using the Internet is important to get rare information worldwide.

Observation

Observation in this research will focus on batik industry especially in Kelantan. Observation is made at the mostly visited workshop in Kota Bharu. From the observation, it points that there are authentic views of batik design in the state. In addition, observation has also been made in the vicinity of Kota Bharu to get the trends and marketing view of batik impact parallel to the identity of Malaysian batik.

Interview

Interview is made to discuss about the batik situation in the fashion industry. Interview has been done before with Iszal Ismail who is a local famous fashion designer of Citra Boutique (Kuala Lumpur). From there, the researcher gained some knowledge in understanding about the current situation of the batik fashion industry. At the same time, the researcher and the fashion designer discussed about the batik motif and how to adapt and enhance the design attraction in batik (Fig. 29.2).

By practicing in the studio, this research will focus on implementation style to get the idea needed. The idea is mostly based on what were obtained in the historical research stage. This is a next step after obtaining the required information. For the first level, study of the subjects should be held. The purpose of this early stage is to know the types of motif, which are suitable for this research as learning subjects. In this research, nature will be the main subject to create the ideation for experimentation and also line ideation. The surrounding environment will be the main subject as it majorly evolves around us.

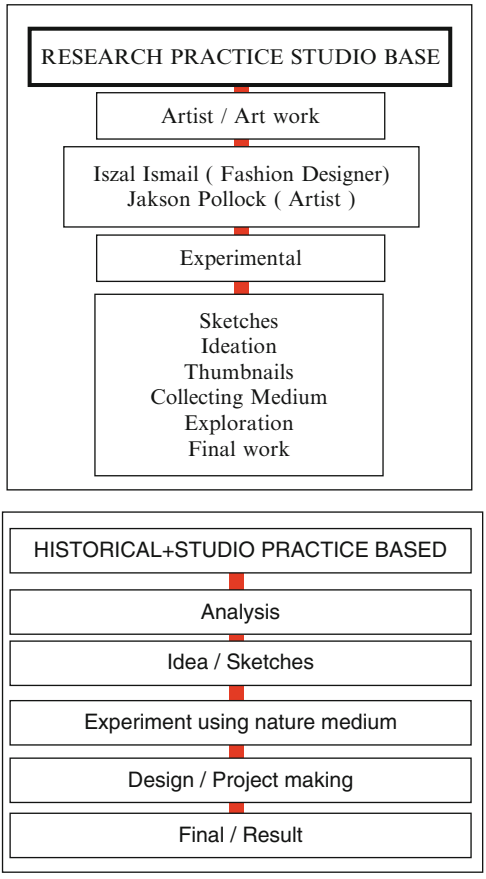


Fig. 29.2 Overview research practice studio-based

Sketches

Sketching is the right way to visualize what the subjects are. Through sketches, the actual image is transferred on paper to get the first look and feel of the real base on visual interpretation, but through indirect sketches, it will be one of the substances of interest documentation. Sketches are also important to vision a character that is also one of the features found in subject study.

Ideation

Ideation is obtained through exploration on the ideas of sketches that have been made. Normally, ideation is the continuation of the sketching process. In other words, ideation is a development process on sketches that were made before.

Thumbnails

The varieties of compilation produce an ideation that is called thumbnails, which is a process made during diversity. Many ideations are in terms of different ideas. This gives some view that the thumbnail is the stage to make ideas more clear.

Collecting Medium

The researcher uses the nature elements to design the batik. All of the data that have been collected will be identified into categories. Then, it will be transformed to a tool which is suitable to produce batik design.

Exploration

After collecting the medium, the researcher will use the nature element as a tool to explore yet to see the effect from the medium. From this exploration, the researcher will document all the effects from nature as a research.

Final Artwork/Project

The final project is the final result which is based on research performance. For this research, the researcher will produce artwork based on the experimentation result.

29.3 Results and Discussion

In this part, the researcher tries to explore another batik technique using nature material as a tool. All of the mediums are already collected from the surroundings. The tool is from the nature itself and is used as a main tool to create the batik. From this exploration, the researcher can make a summary that nature mediums have their specialty because based on the result it shows that a variety of lines depend on the different nature. The exploration purpose is done with a new creation technique using just only the nature as a tool or medium to create the new scene of batik.

The Usage of Nature Material in Batik Making

Through this research, it is found that the use of nature material can result in the creation of batik design to something new. If looking at only one side of the existing method of production, batik designs appear the same, but they still vary from the

aspect of preferred selection of pattern design. Based on the research conducted, construction from element of nature is something new, and this can be developed because batik design product cannot be repeated, and this will enhance the exclusive value of the produced batik itself.

From the aspect of the use of material, nature material has its own character. Every used material will indirectly produce different effects and create patterns and designs that are incontrollable. Production using nature material gives a distinction when people cannot identify the material used for every pattern formed except for the producers of the batik themselves. This will be an advantage to the creation and production of batik, wherein any copying of ideas can be overcome.

Looking at the trend of batik in the market, most batik uses the same medium that is using "canting" and the addition of background with the application of certain techniques. With this research, the researcher will produce batik designs which are a little different with the use of nature material and components that are easy to get. With the said improvement, it is hoped that batik product will have an impact of distinction in line with the objective of the research.

To produce this batik design, the researcher will use natural material from nature medium that are divided into two categories. First is nature medium from what is altered and second is 100 % nature medium. For the altered nature material, the researcher only uses brushes that are manufactured using fiber to attain the desired effects. There are also changes done to the surface of the brushes such as making crevices which can form the desired number of lines. Not only that, the application of this item will be more consistent when the process of repetition can be done as the researcher sees fit.

For the use of 100 % nature material, the researcher uses components or materials which are available around the research area. Indirectly, the researcher states that batik is indeed easy to manufacture, even though without the use of "canting." Altogether, the researcher uses both types of natural material as alternatives to replace the usual method of using "canting." Below are the examples for the exploration by using nature materials (Fig. 29.3):

The result or product is using fabric medium such as cotton, chiffon, plain silk, and jacquard. The different type of fabric has produced a different aspect which means that every medium used creates different positive final result, color combination, and also technique exploration. In this medium, the researcher has produced seven pieces of product in the fabric category (Figs. 29.4 and 29.5).

29.4 Conclusion

From the research and nature experiments, it can be concluded that the new scene of batik can be improved using new techniques including some explorations of new medium to create something different. Based on the objective of this research, the

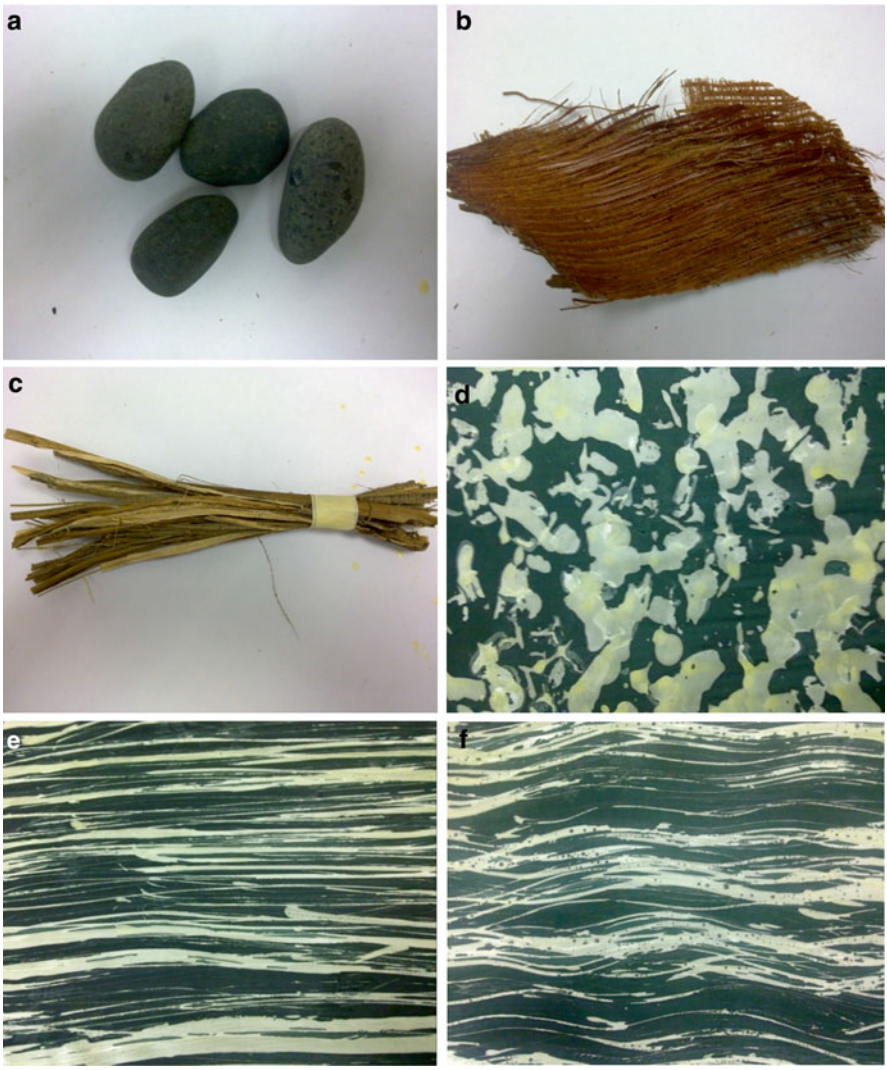


Fig. 29.3 (**a**–**f**) Nature tools and the wax effect

identity of line from nature is clearly known according to the exploration technique just before using nature as a tool and medium of inspiration. At the same time every different type of line creates innovation to produce images on the material selection. As a new inspiration for batik creation, it is identified that this exploration technique can be used for the purposes of fashion and artwork. From the finding, it is found

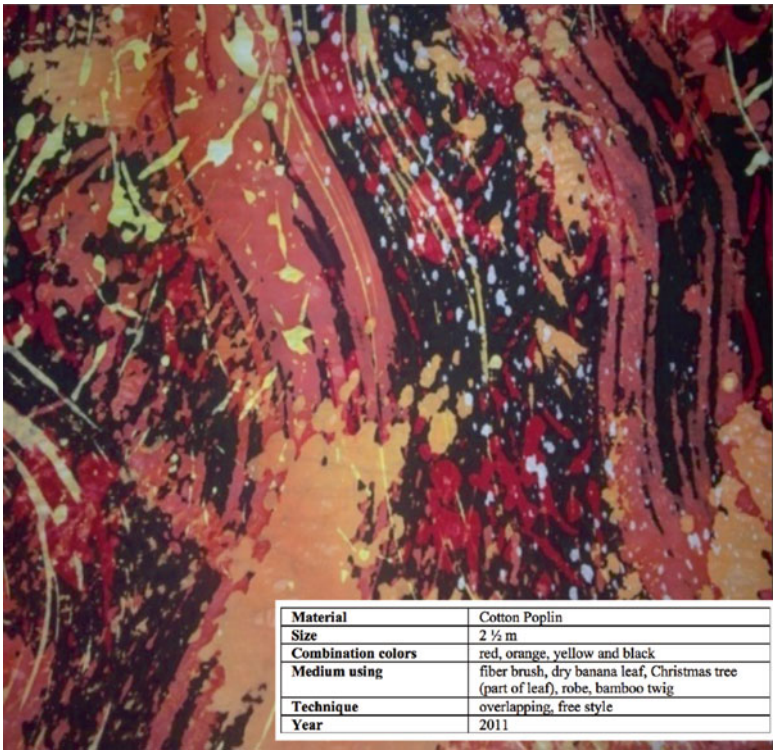
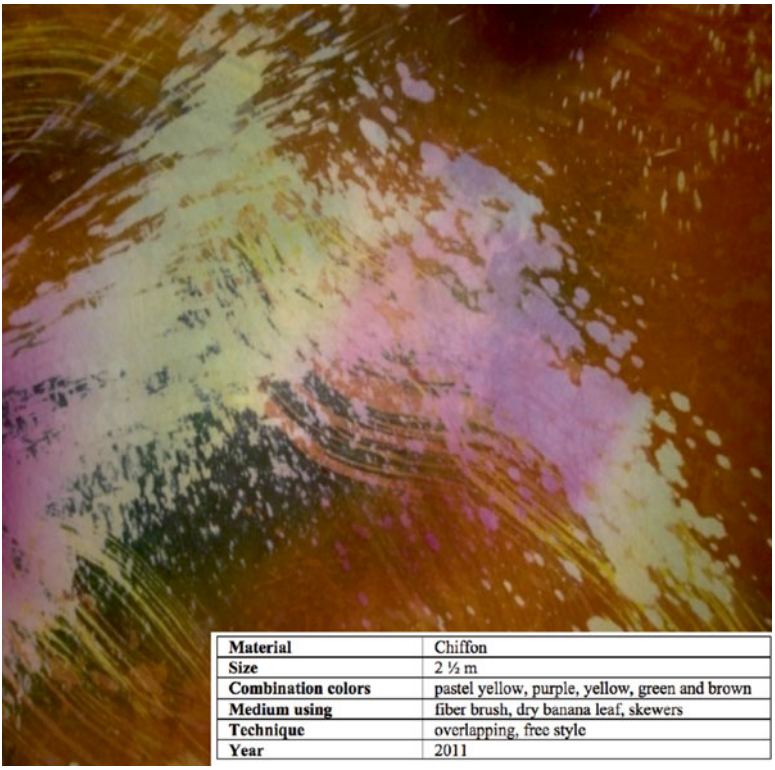


Fig. 29.4 Result 1

that inspiration from nature can produce a unique design which is devised from the effect of nature. Taken from the inspiration, a new character of batik design has been produced using nature images and characteristics. Findings from the previous complete research are suitable to implement for any purposes.

29.5 Recommendation

The outcome can also be used as an alternative for other products which are suitable for soft finishing item including the interior for hospitality decorations. The researcher also would like to recommend this type of batik to be used as uniforms, especially for the government sector. Other than that, this batik also can relate with national identity handcraft products at the same serves to the many of marketing levels. The most important thing is to care and secure that this product with the new innovation is based on trend and market needed for the future. For the next ideation and exploration, the researcher will upgrade and create something more different from this technique but still use the nature element.



Material	Chiffon
Size	2 ½ m
Combination colors	pastel yellow, purple, yellow, green and brown
Medium using	fiber brush, dry banana leaf, skewers
Technique	overlapping, free style
Year	2011

Fig. 29.5 Result 2

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Chapter 30
Promoting the Culture of Philanthropy in Malaysia

Nafissa Mazlan, Farrah Aini Lugiman, and Fazlina Jaafar

Abstract Philanthropy means the desire to promote the welfare of others. The degree of philanthropy in citizens of Malaysia is upsetting. This is proven by the annual global study held by Charities Aid Foundation (CAF), entitled "The World Giving Index." In 2010, Malaysia is in the rank of 76 in the World Giving Index ranking. However, in 2011 Malaysia dropped to the rank of 87. The drop in the ranking indicates that Malaysians are getting less interested to get involved in the act of philanthropy or in doing general good deeds. There are countless nonprofit organizations in the country devoted to the welfare of those who are in need and less fortunate. Nevertheless, not all are successful in achieving their target and objectives. This paper highlights key issues and challenges faced by these organizations. Based on an initial study, the researchers have found some reasons why Malaysians are not keen to be good Samaritans. There is, thus, a dire need to widely promote an awareness and understanding of the importance of philanthropy. The researchers will conduct further study on the perception and acts of Malaysians toward philanthropy to propose a solution to further develop philanthropy in Malaysia. The methodology adopted in this study will be based on a descriptive research and on an observation of the Malaysian culture and perception of the society toward the act of philanthropy. In this study, the researchers will conduct a survey to collect information from the samples of target population. The researchers hope to find a precocious approach to reconstruct the perception of Malaysians toward philanthropy through the use of visual communication and advertising.

Keywords Philanthropy • Promote • Participation • Culture

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30.1 The Act of Philanthropy

In spite of the fact that there is a myriad of views on culture, most explanations emphasize on the idea of shared beliefs, values, customs, and meanings that identify one group of people from another [1]. Culture is presented in a system of language and thought that appears in activity and behaviors, channeled through symbols, artifacts, rituals, heroes, and values [2]. "Social and cultural factors shape the way people make a living, the social units in which they live and work, and the meaning they assign to their lives" [3]. Culture is a set of learned behavior pattern that is firmly fixed in a society [4]. The act of philanthropy in Malaysia can be summarized from "the man in the street responding to the beggar" to "the wealthy businessman forming a foundation to channel his wealth into schools, scholarships, hospitals, or care for the less fortunate" [5]. However, the practice of philanthropy might not survive in the younger generation if there is no act to build and promote the culture of philanthropy. Thus, precocious steps are needed to convey the message and help build this noble culture in Malaysian society.

30.2 Current Perception of Philanthropy

The public's perception of philanthropy in general is rather primitive and unwilling. This is mainly due to the social and environmental factors. Based on the interviews with Malaysia's top philanthropists on the current situation of philanthropy in Malaysia, it is found that philanthropy in Malaysia is private [6]. This means that philanthropy is treated as a very personal thing in Malaysia. The logical reason behind this enigma is to avoid "unwanted attention," such as being criticized as insincere or show-offs, or becoming targets of financial scams. In a survey conducted on general good deeds of Malaysians, it is found that the society has several concerns when doing good. Firstly, they are concerned about their own safety when helping someone. Secondly, they find that it is time stricken to do good deeds to meet the daily life schedules. Lastly, they have financial consideration on giving to charity. The relationship between current perceptions of society with current philanthropic behavior is to be examined closely.

30.3 Generalization of Philanthropic Behavior

The full extent and impact of the act of philanthropy in Malaysia is difficult to judge [7]. This is due to the fact that ethnic-specific philanthropy is supported by both internal and external political, cultural, and economic influences [8]. The act of philanthropy and good deeds in Malaysia can be generalized into ethnic-specific philanthropy [5]. For instance, philanthropy by Malays is mostly through the

mosques by voluntary contributions such as *waqft* (gifts of land or property for the support of religious activities or for the aid of needy) and *sadaqah* (spontaneous charitable gifts which can be in cash, property, or volunteer service). However, *zakat* (obligatory taxation of eligible Muslims), which is required by Islamic *Sharia* law, is not classified as philanthropy [9]. Malay culture values highly the act of giving, and they are known for their generosity toward those in need [10]. Chinese philanthropy in Malaysia is precedent for education and educational access for Chinese people of all social and economic class [11]. On the other hand, the Indian philanthropy in Malaysia varies the contributions from the scholarships and shelters for Indian orphans and the children of Indian plantation workers to the continual of Indian culture and Hinduism [5].

Despite legitimate requirements that recommend cross-ethnic philanthropy, the tendency toward ethnic-specific philanthropy is still prevalent. Much of it remains ethnic specific or targeted to the religious or cultural preservation of the specific ethnic group [12]. This is because ethnic-specific philanthropy is reinforced by both internal and external political and economic influences [8]. Nevertheless, philanthropy in Malaysia today holds the potential for promoting unity among diverse groups, as it is largely aimed at social welfares that have social ramifications regardless of ethnicities [7]. In spite of the growing number of middle class in Malaysia, the perspective of philanthropy shifted and became uncertain of any bound that once limits it [13]. Therefore, by combining charitable acts and sharing information about the good work that is being done by the nonprofit organizations in Malaysia would help in making philanthropy a more open and powerful social component that builds a stronger and charitable nation [5]. Integration of philanthropic influences is necessary in promoting the culture of philanthropy in Malaysia [14].

30.4 Nonprofit Organization and Philanthropic Responsibility

According to the statistical report by the Department of Social Welfare Malaysia, there are at least a total of 1,060 welfare service institutions (nonprofit) for all kinds of services in Malaysia by the year 2013. Apart from that, the government's initiatives include a total of 59 welfare service institutions with the capacity of 8,536 for all services in Malaysia. However, with the increasing severity of underprivileged in Malaysia, for instance, the incidence of poverty in Kuala Lumpur increased to 0.8 % in 2012 from 0.7 % in 2009 as recorded by the Department of Statistics Malaysia.

To identify charitable acts by Malaysians, the researchers have found a statistical report on charitable behavior worldwide produced by the Charities Aid Foundation (CAF) annually called The World Giving Index. The World Giving Index establishes a rounded view of charitable behavior worldwide. The Index is based upon the three charitable behaviors – giving money to an organization, volunteering time to an organization, and helping a stranger. This report is primarily based upon data

from Gallup's World View World Poll (worldview.gallup.com) which is an ongoing research project carried out in 153 countries that together represent around 95 % of the world's population. The World Giving Index recorded the world-giving ranking, and Malaysia ranked in 76th place in 2010. However, in 2011 Malaysia's ranking dropped to the 87th place. In 2012, the ranking went back to the 76th place. The World Giving Index also recorded the scores of countries in the category of giving money, volunteering time, and helping a stranger. In the year 2010, Malaysia scored 32 % in giving money, 29 % in volunteering time, and 30 % in helping a stranger, whereas in 2011, Malaysia scored 37 % in giving money, 20 % in volunteering time, and 30 % in helping a stranger. In 2012, Malaysia scored only 32 % in the category of giving money and 26 % in volunteering time and helping a stranger. Based on these 3 years of scores, it can be inferred that Malaysians have low participation in charitable behaviors, since the scores were not of excellence and impressive compared to other charitable countries.

It would be reasonable to conclude that Malaysians need more consciousness toward their philanthropic responsibility. Providing skillful training for fund-raisers would help to assure that philanthropic contributions are addressed to tackle the causes, which would bring more positive outcomes [15]. Besides that, donors, professional fund-raisers, and nonprofit organizations should convene more to avoid unnecessary duplication of effort that had been generated by both nonprofits and philanthropists [16].

30.5 Promoting the Culture of Philanthropy

In Malaysia, philanthropy is not totally new, but it needs to be promoted to wider audience in order to grow and achieve great improvement [12]. Thus, the current perceptions of philanthropy need to be reconstructed to give way to realize the culture of philanthropy in Malaysia. "Greater transparency of grant giving and fund-raising, and more opportunities for professionalism and networking in the field, should increase the level of giving, help ensure the greater effectiveness of the philanthropy, and help foster inter-ethnic dialogue on common challenges and needs" [7]. Integration of philanthropic influences across ethnicities as well as sharing information about the initiatives and efforts that is being done in Malaysian nonprofits is an integral approach to promoting the culture of philanthropy in Malaysia [14]. On the other hand, it would transform philanthropy from its discreet traditional charity to a more prominent unit of civil society that addresses welfare issues with no barrier of ethnicities [17]. It is important to have absolute knowledge of philanthropy and the backgrounds it covered to attain effective ways of reconstructing the perception of Malaysians toward philanthropy. Hence, visual communication and advertising could easily sift through the target population. This research will contribute to the provision of effective approach of social marketing for planned

behavior change (philanthropic behavior) and then the approach of cause-related marketing as the means of carrying out the philanthropic responsibility.

"Social marketing is the design, implementation and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution, and marketing research" [18]. Social marketing is used by many nonprofit as well as government organizations to encourage social behavior change and to induce compliant behaviors [19]. It is believed that social marketing can have a major impact on resolving social problems [20]. Cause-related marketing (CRM) is defined as: "The process of formulating and implementing marketing activities that are characterized by an offer from firm to contribute a specified amount to a designated cause when customers engage in revenue-providing exchanges that satisfy organizational and individual objectives" [21]. Cause-related marketing allows consumers to express their concerns about environmental and social issues such as environmental conservation, hunger, poverty, and education for poor children as well as the support for disabled people through their purchases in grocery stores or supermarkets at no additional cost to them in terms of time and money [22]. In addition to that, a CRM product purchase provides a consumer with an opportunity to donate to a cause in a way that is simple and convenient [23]. Through the approach of social marketing incorporated with cause-related marketing along with the prudent use of visual communication and advertising, it can help to foster philanthropic behavior and responsibility in Malaysia.

30.6 Significance of Philanthropy

Philanthropy is beneficial to almost all participating parties: firstly, the recipients or the needy; then, the public; and, lastly, the country. The benefit of philanthropy to the recipients is undoubtedly that they will get help and motivation to start over a better life. It would slightly ease their lives when they received help from others so that they can work their priority in finding jobs and earnings for a better life. Consequently, the public too will be benefited in the act of philanthropy, as doing good deeds makes the surroundings fonder. This is proven by a statistical analysis using the Gallup data from Charities Aid Foundation in the World Giving Index (2010), whereby the correlation between happiness and giving is stronger than the correlation between wealth and giving. This suggests that an individual is more likely to give to charity if they live in a "happy" country compared to if they live in a "wealthy" country. It would be reasonable to conclude that "giving" is more an emotional act rather than a rational one. Thus, the public will converge with being spiritually refined as well as being grateful for the good life they have. Lastly, philanthropy is beneficial to the country as it contributes to the development of the nation. The culture of philanthropy will certainly precipitate the emergence of a charitable nation, hence helping the economy grow by charity.

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Chapter 31
Elaborating Context from the Content Making Framework

Guideline Model for the Usage of Fine Art Student in Developing Their Content

Mohd Fuad Md Arif, Farrah 'Aini Lugiman, and Nadiah Mohamad

Abstract This research which is the second part will be an extensive elaboration on the newly formed content making framework. In the first part of the research, the research was conducted to establish and form a framework which looked into two "art interpretation" frameworks. One was from Lucy Lippard's framework extracted by Cynthia Freeland, and the second was from Terry Barrett. Thus, in the second part of the three subseries, this paper will focus on explicating and elaborating the first key principle which is "context." This was done through cross-referencing and interpreting several literatures especially that of Freeland (2003), *Art Theory: A Very Short Introduction*; Barrett (2011), *Making Art: Form and Meaning*; Heartney (2008), *Art & Today*; Robertson and McDaniel (2010), *Themes of Contemporary Art: Visual Art after 1980*; Lucie-Smith (1999), *Art Today*; Lazzari and Schlesier (2008), *Exploring Art: A Global, Thematic Approach*; Kalb (2013), *Art Since 1980: Charting the Contemporary*; and Collins (2007), *Sculpture Today*. Other non-printed key reference was a short-format documentary series from the Sollins and Dowling's ART21 – seasons 1 until 6 (2001–2012).

Keywords Context • Formal • Material • Medium • Meaning • Content • Content making • Phenomenology theme: art as research • Art-based research • Thematic • Studio practice

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31.1 Introduction

One of the most important and fundamental undertakings within the undergraduate fine art studio practice, other than the creation of the "art object" (how to form technically), is the essential concern in initiating and building up the "content," which is more conceptual (theoretical) in nature (Fig. 31.1). Walker explains "How to paint is a technical problem, but what to paint is a conceptual problem when it extends beyond subject matter" [1]. Due to the characteristic of learning in fine art studio which is very open-ended especially concerning with establishing the content, this can in turn pose a rather perplexing experience for students who are in their early stage of building up reasons and direction in creating and figuring out their own "path" in art making. For some students, the way to (this) knowing is having a structured (methodical) system that can act as a "step-by-step" guide. This is especially true when the nature of understanding art now is also dealing with puzzling and complex ideas and contemporary issues that can even baffle most session lectures. Thus, in such condition, this has prompted the researchers to engage in developing a structural framework so that it can be used (and was intentionally developed) by fine art students who have difficulty in developing their content, which as mentioned earlier can be appallingly difficult for those who are very inclined toward a methodical (step-by-step) approach. Here, the term "content making" was designated as a form of partnership to "form making" or "object making" which is more inclined toward producing the artifact or the art object.

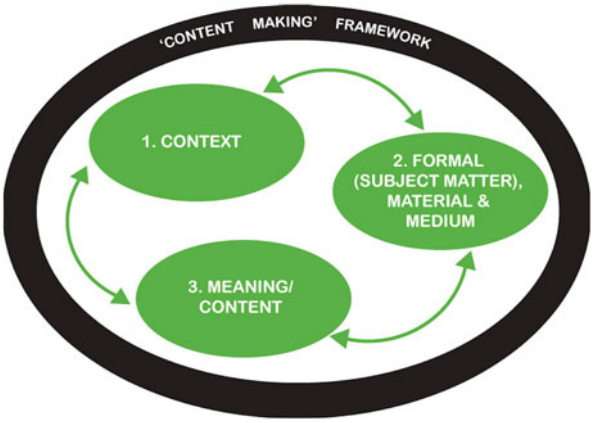

Fig. 31.1 "Content making" framework developed by MD. F. Arif, F. A. Lugiman, and N. Mohamad in the first stage of the research

31.2 Context: Establishing and Understanding Thematic Studies

Meaning and Its "Function"

Studying context (contextual research), in this case within the academic sphere of practice-based (studio practice, i.e., painting, printmaking, sculpture/non-studio, i.e., site specific, environmental works) study, is a vigorous endeavor toward understanding the background or thematic position of art (within its own epistemological logic) or outside issues and ideas (e.g., sociology, politics, cultural) which are being discussed in the context of art. Terry Barrett explained "(m)eanings of artworks depend on context, the circumstances that form their setting. These circumstances in turn vary, from where and how an object is placed, to the way the parts of the object relate, to the history and experience of the artist and conditions in the outside world" [2]. Usually context is an assembly of major thematic ideas that has already been set up and built upon in the art world knowledge (practice), which groups of artists are generally involved in a common thread but engaging in it within an open-ended atmosphere and interpretation. But one thing is for sure, in teaching and understanding "context" in art, it is like what Walker explained "(b)y placing an artist within a traditional artmaking, teachers help students realize that 'art comes from art' – that all artists depend upon models and prior artmaking" [1], which can be briefly summarized that whatever the context maybe, it needs to have a correlation with the art world itself, e.g., how the theme, for example "war," has continually been engaged within the art world.

As a guideline model on how student may start their theoretical research, contextual studies act as a preliminary stage in finding out and laying out matter concerning "main themes" or "big ideas" [1]. The concern is going through background studies, establishing "entry point," and doing comparison which examines the "commonality" ("sameness") and also "differences" (the way each artist is looking at the same theme differently) of the concept and ideas which refer to the development of the theme (big idea). For example, works (and artists) such as *Saturn Devouring His Son* (1819–1823) by Francisco Goya, the *Death of Marat* (1793) by Jacques-Louis David, *Carcass of Beef* (1924) by Soutine, *Figure with Meat* (1954) by Francis Bacon, *Going Forth by Day* (2002) by Bill Viola, and *For the Love of God* (2007) by Damien Hirst can be grouped in a particular theme regarding the question of "death." Although all these works deal with such question, as a way to understand "differences" (individual ideas), each artist is looking into it through a different perspective and by having a different understanding. The study of context is also done in the effort to create related linkage to art theories whether it is critical theory or cultural studies or visual studies, philosophy of art, or even philosophy per se that might be present in the formation of a particular theme.

Things That Need to Be Done and Looked Into

To get things started, each student needs to do an overview research regarding major and reacquiring themes or questions or issues that are pertinent and are frequently discussed and dealt with in the art world. With the abundance of references coming from books and video media (sometimes in a form of video documentary, e.g., PBS's *ART21* documentary series), students need only to have an awareness and strong determination toward discovering and understanding these themes, which can be for most very difficult. This is due to the interweaving and complex nature of many factors such as the presence of distinctive terminologies and jargons, historical aspect, and fundamental questions within art theory and critical theory which students need to address or at least have a fundamental understanding. There are also strenuous philosophical ideas that can sometimes come into the fabric of a theme. It could also be coming from cultural, sociological, psychological, or religious knowledge. But at this stage, students only need to do an overview reading to establish a general understanding of how different themes operate and are being discussed. In such condition, they should understand that such task is not about instigating or pushing themselves in becoming (specialized) theoretician. It is sufficient for students to build a general knowledge about these discussions, because learning art in its practice is not about learning to become philosophers or art theoreticians (or art critics). These disciplines have their own training and path of knowing.

One thing is for sure, there will come to a point where students need to decide on which particular interest they want to move forward with, and this is always an innate engagement. Because this "dealing" is somewhat of having to do with following one's "gut feeling" or one's "heart" or "inner voice," each one is required to "choose" what they want to really work with or look into deeply. A person needs to choose because no one has the capability and capacity to embark upon (in doing, thinking, or saying) all matters in one single moment (or even in one lifetime). But one also needs to understand that, in establishing such theme, decision need not be "singular." It could be a combination of several themes which could work together and have a cohesive and or even a creative or critical relationship. Bill Viola and Damien Hirst, for instance, have a very personal attachment toward the questions of "death" and "life" [3]. There are also artists such as Janine Antoni and Collier Schoor who are concerned with the subject of "loss" and "desire" [4].

Additionally, interest can also be impelled by experience – with one's own situational background or living experiences or with one's concern about art or life. For example, a particular student could be very inclined toward spiritual and religious aspect which is due to his/her own "spiritual or religious" upbringing. But having said so, these kinds of drives still need to be grounded and connected within the art context so that students would have an understanding on how artists are working or have worked with such issue in their own practice. Otherwise one will not have the right intellectual capability and sensitivity in thinking as an artist (on how questions are asked and issues, ideas, materials, and visual arrangement are understood and

dealt with by other – establish – artists). But whatever the choice might be, it must be based upon sincerity and deep reflection of the individual's own interest, intention, and passion, or else, sustaining one's practice or inquiry could be futile.

After establishing such interest, students need to go deeper into the theme by concentrating on the central concept and understanding its relationship and dynamics. The whole idea is to build a comprehensive understanding of the theme. For this, it is very crucial to identify major and related artworks, important keywords, and particular ideas and individuals (doing background study) who are involved in making the works. Information could also be coming from works or other artists who are quoted or referred to by the initially studied artist. In addition, these individuals could be scholars or important non-art world personalities, which are related to the subject. At this stage, it is of course essential that the inquirer identify and gather vital statements of these artists or individuals (or even the writers, e.g., critics). Although it is difficult to decipher all the information, it is important to understand that whatever the outcome is from such attempt, each inquirer needs to do their own interpretation. Bearing in mind, this task is not about getting one's interpretation "objectively correct" but is to reach a condition which has a substance of "rightness." Understandably, it does take time, effort, and patience, which normally might not become an end journey even if one feels that an understanding is settled upon in a particular time and moment. The whole idea is to keep on moving in finding out and also at the same time doing and handling the work.

31.3 List of Themes

In this research, researchers also listed major and reacquiring themes which were gathered from several books and digital-format video documentations. This list was then made into a table (see Table 31.1), divided into six sections. These are *Title of references*, e.g., name of book, digital book, and digital video documentation; *Type*, e.g., book, digital book, and video; *Disciplines*, e.g., various paintings, sculptures, digital photography, and printmaking; *Author(s)*, e.g., writers, producers, and curators; *Themes*, i.e., name of theme(s); and *Reacquiring themes*, i.e., theme that can be found within other references. In the themes listed, color coding was made to distinct themes that were reacquiring in two or more from the references. These reacquiring themes are by no means indicate that other themes are unimportant or sit in a hierarchical position but rather reacquiring theme is a matter of choice which most artists seem keener to engage due to several factors such as current situations that are conditioned by changes, e.g., ecology, deformation, and popular culture; elemental humanistic condition, e.g., identity, power, and spirituality; and also the very state of modern art itself (question of self-referential ideas about art), e.g., abstraction and minimal. This list can be used by students in doing an overview reading (research) when they are in the preliminary stage of finding out themes to choose upon. This list can also be extended or developed or customized by students or even lecturers themselves for identification and comprehension purposes. For instance, a

section on artist and artworks which fits into a particular theme can also be added, or even a section on "keywords" or main ideas.

31.4 Conclusion

As a conclusion, the meanings of artworks depend on the understanding of its context. Generally, context consists of major thematic ideas that have already been shaped and developed within the art world knowledge and practice. The study of context is knowing the themes involved, what and how it is being employed and understood by the artist in relation to his or her particular work or body of works. In regard to the problem of thematic, whether or not it is dealing with the question concerning social, environmental, or political issues, it needs to have a link with the art world itself, e.g., how the theme, for example, "spirituality," is continually being engaged within the art world. When choosing a particular theme to work with, it is important to understand that such decision is based on one's "inner voice" through one's deep passion or intellectual enquiry which can also be brought about due to existing life experience, experienced by the student himself/herself. In most cases,

Table 31.1 List of major and reacquiring themes

Title of References	Type	Discipline	Author(s)	Themes	Reacquiring Themes
Art & Today (2008) [5]	Book	Various	Eleanor Heartney	Popular Culture	Identity
				Abstraction	Spirituality
				Representation	Body / The Figure
				Identity	Nature / Ecology
				Politics	Architecture
				Spirituality	Deformation / Fragmented
				Nature & Technology	Place
				Quotidian Object	Time
				Narrative	Popular Culture / Post-Pop Object
				Body	Memory
				Architecture	Narrative / New Narrative / Stories
				Deformation	Abstraction
				Time	Minimal
				Globalism	Installation
				institutions	Power
				Audience	Politics
Themes of Contemporary Art. Visual Art after 1980 (2010) [6]	Book	Various	Jean Robertson & Craig McDaniel	Identity	Social Protest / Protest
				The Body	Commodities / Consumerism / Consumption
				Time	History
				Place	Culture / Cultural Diversity
				Language	Self
				Science	Globalism
				Spirituality	Quotidian Object / Appropriation
Sculpture Today (2007) [7]	Book	Sculpture	Judith Collins	The Figure	Neo-Expressionism
				The Body Fragmented	
				Strange Creatures	
				Post-Pop Object	
				Architecture & Furniture	
				Cultural Diversity	
				Traditional Materials	
				Ephemera Effects	
				Inspired by Nature	
				Color, Surface & Light	

(continued)

Table 31.1 (continued)

				Memory	
				Clothing	
				Monumentally	
				Installation	
				Gravity	
				Size & Scale	
				Accumulation	
				Minimalism	
Art Since 1980: Charting the Contemporary (2013) [8]	Book	Various	Kalb, Peter R.	Feminist Statement	
				Appropriation	
				Neo-Expressionism	
				Into the Streets	
				Commodities & Consumerism	
				Memory & History	
				Culture, Body, Self	
				Engaging the Global Present	
				New Metaphors & New Narratives	
				Mass Media, Personal Experience & Politics	
Exploring Art. A Global, Thematic Approach (2008) [9]	Book	Various	Lazzari, Margaret & Schlesier, Dona	Survival & Beyond; Food & Shelter / Reproduction & Sexuality	
				Religion; Deities & Places of Worship / Mortality & Immortality	
				The State: Power, Politics & Glory / Social Protest / Affirmation	
				Self & Society; The Body / Race, Gender, Clan & Class	
Art Today (1999) [10]	Book	Various	Edward Lucie-Smith	Pop & After	
				Abstraction	
				Minimal	
				Conceptual	
				Land Art	
				Light & Space	
				Body	
				Installation	
				Neo-Expressionism	
ART21 – Seasons 1 (2001) [11] (Seasons 1 & 2 *One Box Set*)	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Place	
				Identity	
				Spirituality	
				Consumption	
ART21 – Seasons 2 (2003) [12] (Seasons 1 & 2 *One Box Set*)	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Stories	
				Loss & Desire	
				Time	
				Humor	
ART21 – Seasons 3 (2005) [13]	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Power	
				Memory	
				Structures	
				Play	
ART21 – Seasons 4 (2007) [14]	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Romance	
				Protest	
				Ecology	
				Paradox	
ART21 – Seasons 5 (2009) [15]	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Compassion	
				Fantasy	
				Transformation	
				Systems	
ART21 – Seasons 6 (2012) [16]	Video -DVD	Various	Susan Sollins & Susan Dowling (Series Creator)	Change	
				Boundaries	
				History	
				Balance	
Other Themes				War	
				Life & Death	
				Beauty & Ugly	
				Postcolonial Issues	

a particular theme can also be of several combinations of different themes that work together in a paradoxical or even binary opposition, harmonist, or interrelated way. After determining such theme, students need to build a deeper comprehension of the theme by pinpointing central concept and developing an understanding toward its relationship with other related concepts and ideas, e.g., historical aspect. This research also managed to establish and create a list of themes that were collected from several references. This list can be used by students when they are conducting an overview reading (research) during the preliminary stage of finding out themes to choose upon.

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Chapter 32
Visual Advertisement Images in the *Wanita* Magazine: An Empirical Study Toward Women Stereotype

Nurul Akma Wahab and Muhamad Fairus Kamaruzaman

Abstract The levitating number of working women has formed a cultural shift in Malaysia. The advertisers have reacted to this variation by designing innumerable contradictory images of women. There has been an escalating interest by researcher and practitioners in the subject of women task allocation because it is believed that task allocation directly impacts the pattern of society's behavior. Hence, this empirical investigation examines the portrayal and the interpretation of women in classified advertisement published in *Wanita*, a Malay language magazine published in Malaysia. It is believed that the investigation plans to explore the issue of stereotyping women in current and traditional commercials. Even though Malaysia is now an emerging country with modern society, the classified ads still portray women as being conservative and stereotype.

Keywords Women • Advertisement • Stereotypes • Interpretation • Motivation

32.1 Introduction

Malaysia is a multiracial country made up of three major groups, mainly Malays, Chinese, and Indians. It is very diverse in terms of language, religion, and culture. It is believed that the British colonization has somewhat influenced Malaysian women today in the way they act, think, engage, and behave [1]. Malaysian women at present are very responsible and accountable and show fanatical female leadership characters. It is also believed that women nowadays are also vocal pertaining to

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their needs and wants [2]. Holding high posts in the public and private sectors, Malaysian women's earning power has increased, giving them tremendous consumer power. After independence, Malaysian females' literacy is also high, due to their educational status. Thus, more women are now inclined to read magazines such as *Wanita*, *Perempuan*, *Jelita*, *Remaja*, *Nur*, and *Anis* [3].

32.2 State of the Art

Magazine still remains the most predominant vehicle promoting stereotypes in advertisements. This section will discuss the stereotyping of women in advertisements [2] and explain that stereotypes are best described as ignoring diversity and making sweeping generalizations about a group's values, behavior, and beliefs. Women are stereotyped in advertisements in two groups: housewives and employed women. Housewives are portrayed as traditional women who work in the domestic space, while working women are portrayed as modern women with high salaries [3, 4] Believe that many advertisement elements associate with good-looking women because they represent an appealing figure. It is worthy to note that advertisers tend to use women as decoration to their product [5]. Women's facial expressions are more mesmerizing and charming, making them more influential, swaying, and persuasive. Women's visual images in commercials are often associated with arts, politics, and economics.

Stereotyping in Advertisements

Women are often stereotyped in advertisements. According to [4], one of the most strident criticisms of the way in which women appear in print advertisements is that women are portrayed in an extremely narrow range of roles, with depictions concentrated on the traditional occupations as housewives, mothers, and secretaries.

Traditional Women

Women portrayed as traditional have always been associated with household products or placed in domestic settings [5]. Women have frequently been stereotyped as mothers or as housewives. Besides, women also emerge as representative for restroom and kitchen products. This emphasizes the stereotype that a woman's place is at home. Commercials, for instance, appearing in *Wanita* use women to sell body refinement products. Women in advertisement are often portrayed as good, perfect housewives, and mothers [5]. Women portrayed in traditional roles and

responsibilities are associated with domestic products such as laundry detergents which includes brands like *Breeze* and *Fab*. This classified ad depicts housewives with their kids doing outdoor activities where the kids play with dirty objects. Even though the children's clothing is full of dirt, she still smiles. Here, the woman is featured at ease, not worried because she has good domestic products such as *Breeze*.

Modern Women

As modern women, they are portrayed as highly educated, powerful, holding high posts in the business sector, and having high salaries. With the advancement in the women's movement and equal rights, more and more women are entering the workforce. In advertisements, we can always distinguish between working women and housewives by their mannerisms and their clothes. Stereotypes in Malaysian advertisements happen even though there are many highly educated employed people there. Working women are portrayed as very successful, career oriented, professional, confident, and attractive. They portray working women as having luxury items such as cars and jewelry. They are also featured in expensive clothes, cosmetics, and perfume. Here they are portrayed as beautiful and stylish [6]. It is believed that working women are portrayed as influential as they have their own incomes. Working women in Malaysia, according to [2], spend half of their income on luxurious products. Hence, they are portrayed in advertisements as professional women and appear as attractive, elegant, and sophisticated. In one advertisement published in *Wanita*, a working woman is portrayed as spending and purchasing luxurious products in a boutique. Here she is seen wearing beautiful and expensive clothing. Besides being portrayed as professional and confident [7], argues that working women are also portrayed as sex objects. This is because of the outfits they wear. Most working women in the advertisements are portrayed as wearing sexy outfits such as miniskirts. Furthermore, modern women habitually play supporting roles to men, stereotyping them as subordinate to male bosses [7]. It can also be observed that working women are seen as emphasizing their bodies. This can be seen, for example, in the Braun Buffel handbag advertisement which appears in *Wanita*. Sometimes advertisements combine both images of working women and housewives. Although women are portrayed as professionals, they are still featured as mothers. However, women are still not empowered, as they are featured subordinate to men. Often they are portrayed as clerks, secretaries, and typists. For example, in an advertisement for Nescafe, a woman serves her boss. Sometimes women are also featured as agents of hospitality such as public relations officers entertaining guests and officials in the office or in guest rooms. She is also seen at official functions as an assistant carrying documents and helping officers during the signing ceremonies.

32.3 Research Design

This empirical research will use textual analysis and breakdown as its methodology. It will examine the placement of women's visual images in advertisements, particularly in *Wanita* magazine. It will concentrate on where and why women are being portrayed and exposed in a magazine. It also investigates the intention, purpose, and use of women's visual images in the classified ads. Articles and academic journals were collected from various online databases including IEEE Xplore, ScienceDirect, SAGE, Springer, Scopus, and Thomson Reuters.

32.4 Conclusion

As in women stereotyping, there has been very little change as women are still being stereotyped as either traditional or modern even though women now are more qualified. They are still stereotyped as in the 1980s' conventional gender framework in advertisement. Even though women are said to hold high posts, their image is still being portrayed as housewives. It seems that they cannot run away from this. Even though women are portrayed as professionals, they just play supporting roles to men, stereotyping them as only subordinates and as housewives. So regardless of their educational level or career status, the conservative perception of women's role still remains in the family. The worst part of stereotyping women is that they are always portrayed as sex object for men. Even though Malaysia is a modern country that promotes the progress and equality of women, advertisers still need women, reducing them often as either housewives or working women.

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Chapter 33
A Blended Method for Generating Creative Product Concepts

Hung-Hsiang Wang

Abstract Concept generation during earlier conceptual stages is an important but unsystematic activity in product development processes. This paper aims to propose a design method integrating metaphor, conceptual blending, AEIOU framework, and three-level cognitive processing together for generating creative product concepts. The method consists of the six steps: (Eberle B. Help! In solving problems creatively at home and school. Good Apple, Inc, Carthage, 1984) define target using AEIOU; (Jones JC, Design methods: Seeds of human futures. John Wiley & Sons, New York, NY, 1980); search source based on similarity and dissimilarity mapping spaces at visceral, behavioral, and reflective levels; (Kelley T, Des Manag J 12(3):35–42, 2001) evaluate metaphor; (Fauconnier G & Turner M, Cognit Sci 22(2):133–187, 1998) construct input by transferring the target and source; (Wang HH, Int J Des Creativity Innov, doi:10.1080/21650349.2013.830352, 2013) construct blend in accord with blending principles; and (Lakoff G & Johnson M, Metaphors we live by. Univ. of Chicago Press, Chicago, 1980) evaluate blend. Application of the method to a creative lamp, "Dragon Dancing," is demonstrated and discussed. The final design using the blended results presents an impressive blend of a popular folk activity in Taiwanese culture with a good modern lighting and was recognized by the jury and participants as one of the most creative pleasurable designs at a design exhibition.

Keywords Industrial design • Creativity • Metaphor • Conceptual blending

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33.1 Introduction

Concept generation is vital to creative product development, especially in the earlier stages of the design process. A useful technique to generate original ideas in the earlier stages is to look for unusual combinations of other ideas. For example, creative design methods such as SCAMPER [1], morphological analysis [2], and prototyping [3] share a similar manipulation of such combinations. In many cases, they are rather unsystematic. One major reason is that their manipulation lacks theoretical explanation, though several theories related to creative thinking with combinations have potential for generating creative product concepts, especially conceptual blending theory [4, 5] and conceptual metaphor theory [6–8]. Thus, this paper aims to integrate these two theories and frameworks with other product design frameworks to develop a systematic design method.

33.2 Related Works

Concept Generation as Blending

Conceptual blending is a concept-synthesizing process to generate a new concept that is not included in the two input concepts but inherits some characteristics of the concepts from them [9]. A blend consists of four connected *mental spaces*: two partially matched input spaces, a generic space constituted by abstract structure common to the input spaces, and a new, blended space. Mental spaces refer to a description of how people's ideas about things are structured. A blend receives a partial structure, comprising of elements and topologies, from both input spaces but has an emergent structure of its own.

Blending starts with a cross-space mapping that connects elements and relations between two input spaces. The next step is to identify a generic space that reflects some more abstract structure shared by the two inputs and defines the core cross-space mapping between them. Meanwhile, another partial projection is from the input spaces onto the blend space. The blend is supposed to have a new emergent structure not provided by the inputs and can become the input space of another blending in a recursive way. To result in a good blend, there are three main principles of blending as described below [10]:

(a) Composition: The projection from the input spaces makes new relationships available that did not exist in the original inputs.
(b) Completion: Our background knowledge in the form of cognitive and cultural models allows the composite structure projected onto the blend to be viewed as part of a larger self-contained structure in the blend.
(c) Elaboration: The blend has its own emergent logic, and this can be elaborated to produce new ideas and insights.

Moreover, there are four types of conceptual integration networks: simplex, mirror, single scope, and double scope, in a sequence from plain blending through elaborative blending [11]. The classification is based on how the structures from various input spaces are integrated in the blend space. For simplicity, this study defines a structure as the set of elements and their topology; the latter is the structure of relationships between the elements of a mental space.

Figure 33.1 illustrates the classification based on various blends with elements and topologies. Each larger circle represents a mental space, within which smaller circles denote elements and solid lines linking elements denote relationships between the elements. Dashed lines link elements of different spaces and represent projections from generic space onto input spaces and from input spaces onto blend space, whereas double-arrowheaded lines represent the mapping between the two input spaces.

For each four-space integration network in Fig. 33.1, the two mental spaces at the middle level are input spaces, *I1* and *I2*. The bottom mental space is a blend space, *B*, while the top one is a generic space, *G*. Elements of each generic space are represented by blank circles, yet in the rest spaces, elements are represented by filled circles. In a simplex network, one input has a topology projected into the blend, whereas another input has no typology but elements are projected into the blend.

In a mirror network, all spaces share a typology. In a single-scope type of network, the topologies of the inputs are different; only either one is projected to structure the blend. In a double-scope type of network, the typologies for the blend are brought in from both inputs. In terms of manipulation, double-scope and single-scope types of integration networks are generally more creative than simplex and mirror types.

AEIOU as Mental Space

Industrial designers often use some frameworks to build mental spaces for understanding the design problem given. Among these frameworks, AEIOU is a frequently used one for guiding and structuring data acquired from ethnomethodology and conversation analysis [12, 13]. AEIOU stands for five interrelated and

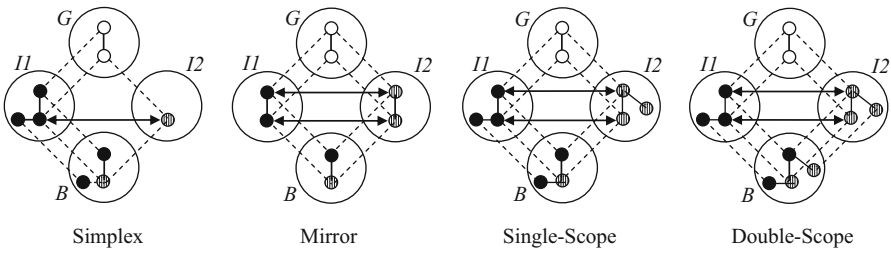

Fig. 33.1 Four types of conceptual integration network

interdependent components: Activity, Environment, Interaction, Object, and User. Activities are goal-directed actions, including the specific actions and processes that people use before, during, and after accomplishing their personal goals. Environments are the contexts in which an activity takes place. Interactions are between a person and other people or things in the environment. Objects are the individual elements of an environment, which may be put to simple or complex uses defining their function, meaning, and context within an activity. Users are the people whose behavior is being observed. When used to generate creative concepts with blends, this framework can be a basis for constructing the target domain and the first input space.

Three Levels of Cognitive Processing as Mapping

Starting with blending, designers often need metaphor sources that offer ready-made material of mappings between both input spaces. Three levels of cognitive processing (also called three-level emotional design framework) [14, 15] can help find the candidate metaphor in a systematic way. The visceral (reaction) level is the lowest level about sensory input, such as how things look, feel, and sound. The behavioral (routine) level is the middle level about use and usability concerning how things function and about the skilled and well-learned, largely routinized behavior. The behavior can be enhanced or inhibited by the reflective level and, in turn, enhance or inhibit the visceral level.

In addition, the bodily category, e.g., classifications based on human-scale interaction with objects such as chair or table lamp, is associated with the behavioral level. The reflective level is the highest level about meaning, dependent on the individual and influenced by knowledge, learning, and culture.

Once a target domain, *T*, has been specified, designers begin to search for source domains, *S*, as candidate to be used in blending process. One useful approach to exploring the source domain is based on similarity between objects and dissimilarity between categories [16, 17].

Accordingly, a good candidate is similar to the target domain at the visceral or behavioral levels (*V sim* and *B sim*) to create significant relevance but is dissimilar to the target domain at the reflective level (*R dis*) to create surprising effect, as the model shown in Fig. 33.2. In other words, the source's image (or meaning) is used to represent the target, though the images are different. The double-arrowhead lines between filled circles denote similarity or dissimilarity between properties of the two domains at various levels.

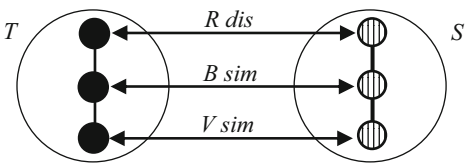

Fig. 33.2 Mapping with visceral and behavioral similarity and reflective dissimilarity

The above mapping can be extended by taking categories of the target and source into account, as depicted in Fig. 33.3. To create a surprising effect, the dissimilarity may be at the category level (*C dis*) or at the reflective level (*R dis*). When category dissimilarity is considered to generate a surprising effect, the similarity at the object level (i.e., visceral or behavioral and reflective levels) is thus measured to generate significant relevance.

As a result, a good candidate is similar to the target domain at object levels, including *V sim*, *B sim*, and *R sim* between the target object, *To*, and source object, *So*, respectively, but its categories, *Sc*, are dissimilar to the target domain's category, *Tc*. The dashed single-arrowhead lines start from the members to their categories.

33.3 The Blended Method

The extensive mapping in Fig. 33.3 for searching good metaphor sources and the conceptual integration network for blending creative concepts can be combined together to a design method. As illustrated in Fig. 33.4, the method comprises the following six step:

(a) Define Target: When a design problem is given, the designer transfers it to the target of metaphor. The problem is then constructed as a scenario, <*Activity, Environment, Interaction, Object, User*>, in which users interact with objects in contexts to perform activities, in order to build up the target domain.
(b) Search Source: The source domain is searched by mapping AEIOU at visceral, behavioral, reflective, and category levels. The cross-domain mapping from the target to the source as a starting point of blending is based on the similarity and dissimilarity, as described in Fig. 33.3. **A** useful category is largely of bodily level.
(c) Evaluate Metaphor: Alternatives are reviewed whether the similarity and dissimilarity are balanced. If one alternative is satisfactory, go to the next step. Otherwise, return to steps 1 or 2.

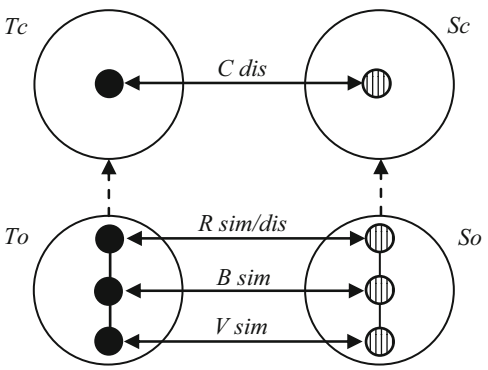

Fig. 33.3 Mapping with visceral, behavioral, and reflective similarity and category dissimilarity

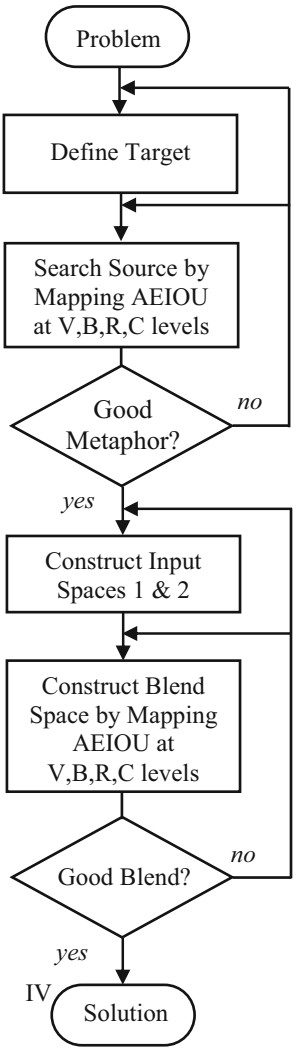

Fig. 33.4 Flowchart of concept generation using conceptual metaphor and conceptual blending

(d) Construct Input Spaces: AEIOU is the default structure of the generic space, in which the input spaces 1 and 2 are constructed based on the target and source obtained.
(e) Construct Blend: Blend the input spaces by cross-spaces mapping. The principles of composition, completion, and elaboration are applied to the blending process for pursuing a single-scope or double-scope blending.
(f) Evaluate Blend: Alternatives are reviewed whether the principles are met. If an alternative is satisfactory, view it as the solution and terminate the process. Otherwise, return to steps 4 or 5.

33.4 Example

Dragon Dancing Lamp, designed at the author's design studio, as shown in Fig. 33.5 and Fig. 33.6, is a floor lighting designed by mixing scenarios of modern lamps with dragon dancing in Taiwanese folk culture to deliver quality of creativity, esthetics, and meaning [8]. The design process is described as the following:

Define Target

At the beginning, the designers roughly chose lamp and Taiwanese traditional ceremony activities as the target domain and source domain, respectively. The target domain is represented by the AEIOD structure, <*lighting adjusting, at lounge, turn on/off, lamp, user*>, while a typical lamp's basic visual elements and topology are expressed as a lampshade on a tube with a base.

Searching Source

A collection of candidates, including night-market pinball and candy haws, aboriginal hunting and sun-shooting myth, as well as many other cultural aspects in Taiwan, are explored. Examining a number of candidates, the design team chose dragon dance as the source domain.

Fig. 33.5 A partial rendering of three lamps connecting together

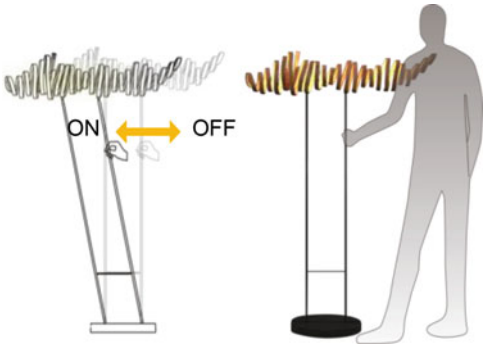

Fig. 33.6 Switching the parallel linkage to turn on/off lighting

Evaluate Metaphor

Dragon dance is evaluated as a good metaphor source, because the basic visual elements and topology of long dragon-shaped body on poles are very similar to that of the floor lamp, but the bodily categories as well as reflections of these two domains are different. By searching the source domain, the target domain is focused, in return, on the bodily category: floor lamp.

Construct Input Spaces

A typical floor lamp is constructed as input space 1, represented by AEIOU, <lighting adjusting, at lounge, turn on/off, floor lamp, user>, and its typology is represented by on(lamp shade, tube) and inserted_in(tube, base). Dragon dance is constructed as input space 2, represented by < dancing, outdoor, wield, dragon shaped object, player>, and the typology of the object used is represented by on(dragon shaped body, pole) and held_by(pole, hand).

Construct Blend

Constructing the blend space is essentially an iterative process. In brief, the process is divided into three rounds. First of all, the emphasis is put on the interaction with objects in the two scenarios at the visceral and behavioral levels. There is a sequence of three sub-blends, as illustrated in Fig. 33.7. In the first round of blend, the visual structures of the lamp and dragon-shaped artifact are mapped to each other in order to create a lamp with dragon-shaped shade on the poles. The team members' wielding of poles when performing dragon dance is projected onto the users switching the lamp by wielding the lamp tube.

This is an emergent property at the visceral and behavior levels, following the composition principle. Traditionally, dragons were constructed from wood, with bamboo hoops on the inside, though nowadays these materials have been replaced by lighter materials such as aluminum and plastics. Consequently, the bamboo hoop is projected onto the material of the lamp shade. The integration network in this round is of double-scope type.

Evaluate Blend

As described previously, outcomes of the first round meet the composition principle and reveal an emergent property at visceral and behavior level and a single-scope integration network. In the second and third rounds, the integration networks

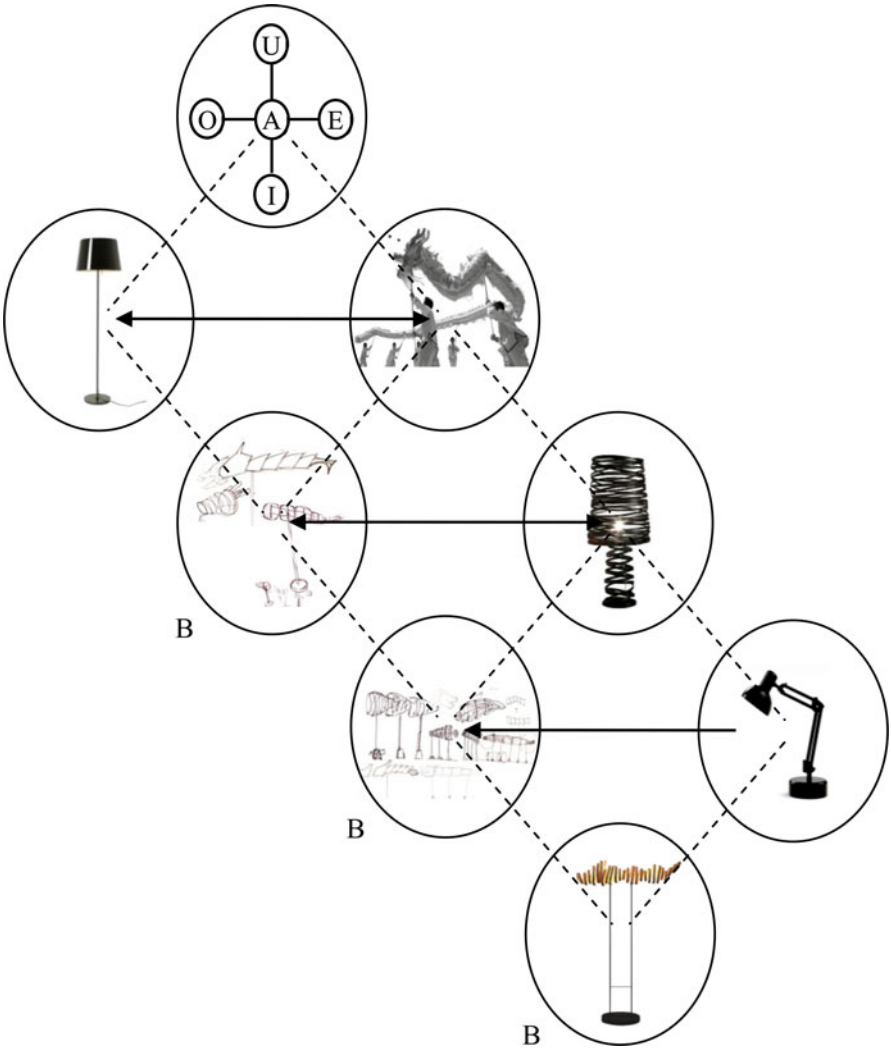

Fig. 33.7 Blending process of *Dragon Dancing Lamp*

are both single scope. The final prototype based on the third blend space is shown in Fig. 33.5 and was recognized by the jury and participants as one of the most creative pleasurable designs at the final presentation and exhibition of concept design of future products in 2011, funded by the National Science Council (NSC) of Taiwan [18].

The second round is to mediate the abstraction at visceral level in order to stress on behavioral similarity between floor lamp and dragon dancing. On the one hand, each several floor lamps can be put together as many sections are joined to assemble a long dragon-shaped body. On the other hand, a creative lamp, *Curl My Light*,

designed by Dima Loginoff [19], made of round sectional metal frame and diffuser is similar to the bamboo hoops of the dragon-shaped body. Thus, the form and assembly are blended with the first blend to generate new lampshades made of curl bamboo, to which LED strip is adhered.

In the third round, more details are refined, following the elaboration principle. The parallel linkage frequently used in desk lamps is projected onto the third blend to maintain the parallel movement of the lampshade when the user waves the lamp tube.

33.5 Conclusion

The design method proposed offers simple but useful guidelines that integrate frameworks of AEIOU and three-level emotional design framework, theories of conceptual metaphor, and conceptual blending to define the problem, search the source domain, and generate blends. Its application to the Dragon Dancing Lamp design demonstrates some new elements and topologies that are not included in the input spaces emerging from the iterative three-round blending process. The process is at large from a double-scope integration network through single-scope ones, generating highly creative concepts. In addition to culture creative product design, the method has potential for enhancing design innovation and emotional design in other product categories. More research is needed on developing blending principles by product design.

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Chapter 34
Symmetrical Pattern: Analysing *Songket* in Wallpaper Patterns

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Abstract Various patterns can be found in traditional Malay textile fabrics such as stripes, checkers and zigzag. These patterns often provide opportunities for identifying the unique mathematical patterns in the traditional Malay songket fabrics. Basically in songket, there are six types of patterns which have been identified by local weavers. However, this paper will explore more patterns in classifying mathematical pattern groups such as the frieze patterns and wallpaper patterns. By understanding regularities based on the data we gathered, we can actually predict what comes next, estimate if the same pattern will occur when variables are altered and begin to extend the pattern. The classification of wallpaper pattern can be found in the badan kain of a sarong and badan kain of a traditional shawl. This paper seeks to identify early Malay songket textiles within the context of the mathematical pattern groups in the twentieth century, which may have influenced, or been influenced by, technical development in the production of pattern-woven textiles from the Islamic world.

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Keywords Songket • Symmetry pattern • Wallpaper pattern

34.1 Introduction

The analysis of textiles in *songket* offers an exciting opportunity to classify the material culture of *songket* pattern within the mathematical approach. The *songket's* traditional pattern portrays the Malay weaver's talent motivated by devotion and act of submission to the Creator of the Universe (*Allah*) which the Muslim regard as the source and origin of all creations. Islam has taught the Muslim to see the natural world which portrays the greatness of Allah's creations. His greatness can be seen in nature, for example, the beauty of the petal arrangement in flowers, the repetitive shape in bee hives, the different arrangement of clouds, the stars in the universe and many more. In *Quran*, some of the verses are repeated so that they will be remembered and understood. It is the same with the Islamic design. The motif is repeated to form into a harmonious pattern. As mentioned in the hadith, *Allah is beautiful and He loves beauty*; as such, the motif must give the feeling of harmony, balance and pleasing to the eyes. The harmonious patterns of the Islamic art can be further observed in this study of *songket* patterns that include the symmetry principle, which is the transformation of design through translation, rotation, reflection and glide reflection. In this work, we would like to report on the symmetrical pattern through analysing *songket* motifs in wallpaper group.

34.2 Songket

Songket is a Malay heritage textile which is originally woven using either cotton or silk with extra weft weave of gold or silver threads. In the past, this cloth was specially designed and made for the royalties. *Songket* was usually found in the Malay communities with Islamic beliefs who live by the rivers or sea [1]. The Malay weavers usually get their materials from other countries such as silk from China, cotton from India and metallic threads from the Middle East countries. Therefore, the weavers lived near the sea for easy access to the port for weaving materials [2]. The *songket* design motifs were usually repeated within the areas by different sections in a *sarong* or a *selendang* (shawl). The *songket* motifs were mainly floral in nature. Sometimes fauna motifs are used by stylising them into geometrical shapes or by distortion. However, nowadays, the designs are totally floral and geometrical shapes which the designers developed. It is a challenge for the designers to come up with extraordinary and decorative designs in order to become the greatest pattern maker of their time. Therefore, this study aims to find out how the designs developed into which category in today's mathematical findings.

Geometric motifs are popular among the Islamic designs which can also be found in *songket*. The process of making *songket* itself involves the calculation of the amount of warp, weft yarns to be prepared and the numbers of *tekat* in *songket*

to be made. Therefore, in designing the *songket* pattern, graph or point paper is used for easier calculation for the weaver to follow. When the warps had undergone the process of threading or making of shafts, it is then ready for *menyongket bunga* and *angkat butang* where the weaver works by using the fine stick or *lidi* to make the songket design. Later, the weaver will start weaving using *torak* or shutter filled with weft yarns [3]. In looking at the shape of a sarong, we could find that there are sectional areas with different patterns. For example, the sarong has the *kepala kain* with *pengapit kepala kain*, *badan kain* and *kaki kain.* Basically, there are six main types of patterns in *songket* designs. They are the *songket corak penuh* (overall or full pattern, e.g., *corak teluk berantai*), *songket corak bertabur* (spotted or scattered pattern), *songket corak jalur* (striped pattern), *songket corak siku keluang* (zigzag), *songket corak petak catur* (checkers) and *songket corak pucuk rebung* (triangle). However, what we would like to find out is how the *songket* motif is repeated and how it can be classified in the mathematical pattern groups such as the symmetry groups of the wallpaper patterns.

34.3 Geometrical Concepts of Symmetry and Transformation

In *songket* design, the motifs can be taken from nature which are mainly in organic shapes; nevertheless, the structure of the motif in weaving will be in geometrical shape governed by symmetry principles. The definition of symmetry is the exact match in size and shape between the two halves of the design. Symmetry also refers to the quality of being made up of approximately similar parts facing each other or around an axis. Symmetry is found in four perspectives which involve translations, rotations, reflections and glide reflections [4]. It is important to study the symmetry in *songket* patterns so as to enable us to classify each motif and pattern into the mathematical pattern groups [5]. Symmetrical designs in textile produce a pleasing effect; but if the motifs are too close, it could be monotonous.

Translation

It is a repeating pattern or the motif slides up, down, right, left or diagonally while still maintaining the same orientation. The formal definition of a translation is every point of the pre-image moves at the same distance in the same direction to form the image (Figs. 34.1, 34.2 and 34.3).

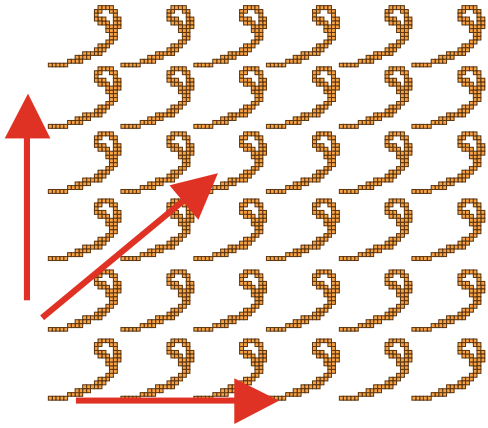


Fig. 34.1 The motifs move at the same distance in vertical, horizontal and diagonal direction

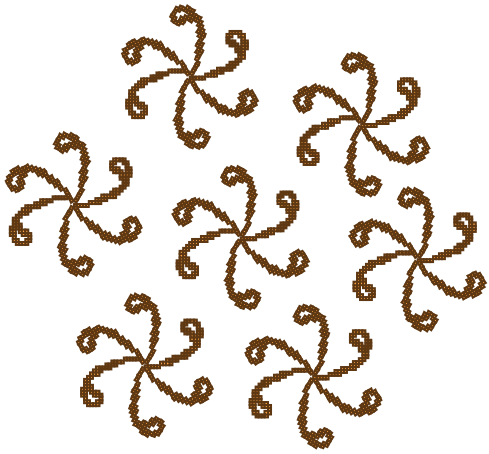


Fig. 34.2 60° rotation

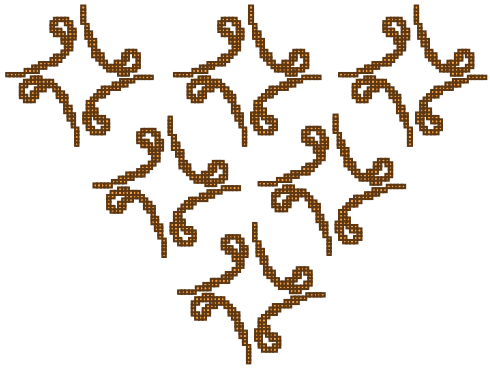


Fig. 34.3 90° rotation

Rotation

It is when a motif is repeated around a point. It is a transformation that is performed by 'spinning' the object around a fixed point known as the centre of rotation. The angle of rotation can be 60°, 90°, 120° or 180°, and it can rotate either in clockwise or counterclockwise (Figs. 34.4, 34.5 and 34.6).

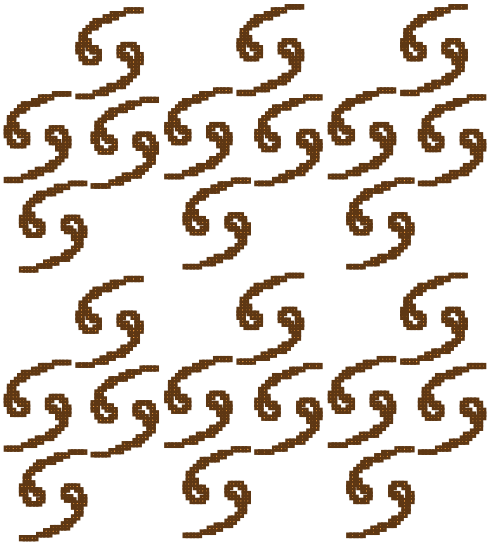


Fig. 34.4 180° rotation

Fig. 34.5 Eightfold rotation in Arabic design

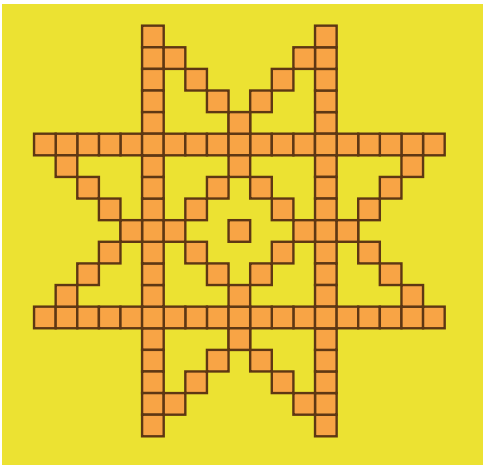


Fig. 34.6 *Tapak Sulaiman* motif or *Bunga Bintang Beralih* in *Songket* with eight pointed stars

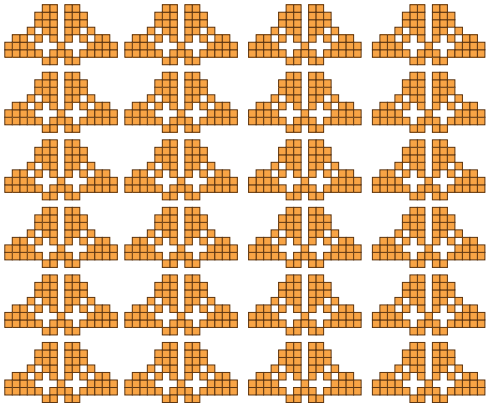


Fig. 34.7 Vertical reflection

Reflection

It is a 'flip' image of an object over a line, 'the axis of reflection', and it can also occur when a motif is reflected and the image is reversed as in a mirror (Figs. 34.7 and 34.8).

Glide Reflection

It happens when a motif translates along the axis while at the same time reflects across an axis (Figs. 34.9 and 34.10).

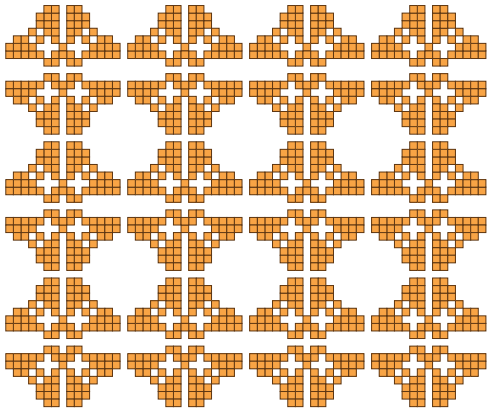


Fig. 34.8 Horizontal vertical reflection

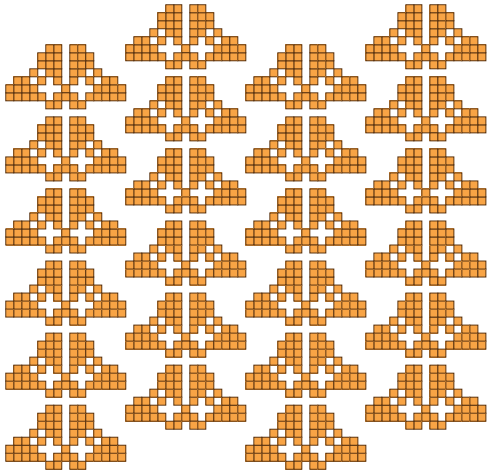


Fig. 34.9 Glide reflection

From the explanation on the four concepts of symmetry and transformation, we could visualise any pattern in *songket* cloth which could fall in any of these repetitions [6].

The songket motifs and patterns, as well as their compositions, show the *songket* weaver's artistic or creative mind at work. In the production of *songket*, the design is determined prior to the weaving process. Therefore, a weaver needs to calculate the amount of warp and weft for the weaving as well as to determine the pattern of a *sarong* or a *selendang*. This paper will study a few *songket* cloths in the section of the *badan kain* (main body of sarong), *kepala kain* (head panel) and *punca kain* (ends of the shawl).

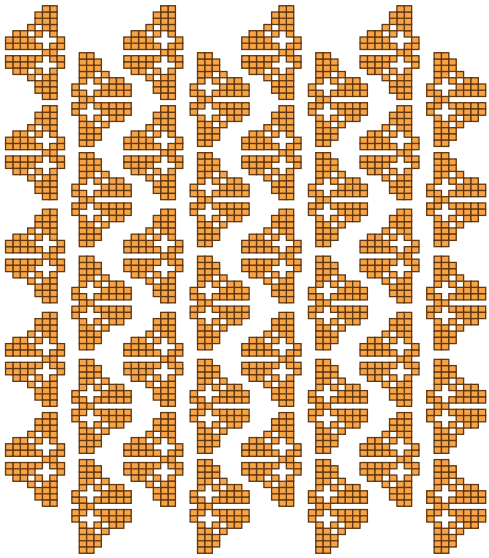


Fig. 34.10 Glide reflection

34.4 Wallpaper Pattern in *Songket*

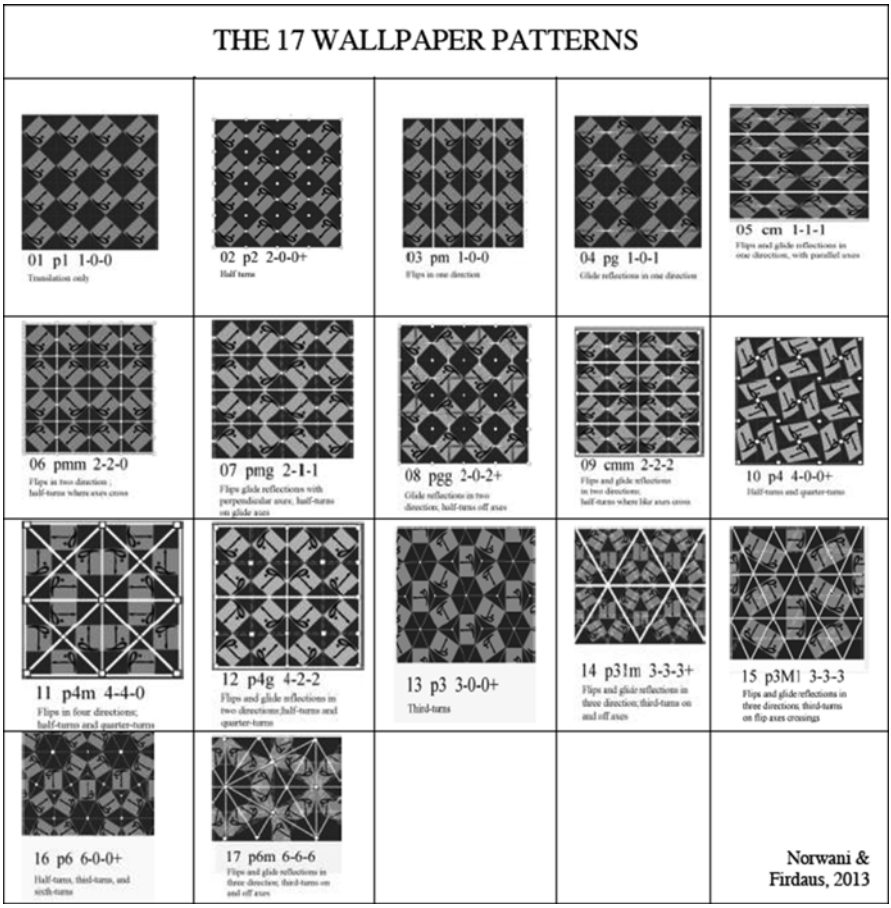
A wallpaper group or plane symmetry group is a mathematical classification of a two-dimensional repetitive pattern, based on the symmetries in the pattern. There are 17 possible distinct groups [7]. Wallpaper groups are two-dimensional symmetry groups, intermediate in complexity between the simpler frieze pattern groups and the three-dimensional group. The word 'group' as used in the English language just means 'a bunch of things considered together'. Mathematicians need a word for something more, and, for better or for worse, they decided on 'group'. A group of things, for a mathematician, means a collection of things with a certain structure.

In songket, we only study on its repetitive pattern that falls either in frieze or wallpaper pattern. From this study of songket patterns, it seems that we studied on the badan kain of the sarong and the end cloth of the shawl. In most of the sarong songket, the patterns are in full, isolated and stripes patterns; however, we would like to find out if these patterns fall on which symmetrical groups of wallpaper patterns [8] (Table 34.1).

34.5 Classification of Wallpaper Pattern That Can Be Found in Full-Pattern Songket

Designs in songket were mainly taken from the sarong and the traditional shawl. Here are some examples of wallpaper pattern in songket as shown in Figs. 34.11, 34.12, 34.13, 34.14, 34.15, 34.16, 34.17, 34.18, and 34.19.

Table 34.1 The 17 wallpaper patterns



Patterns in *songket* are well arranged by the weavers. Motifs and patterns were designed in such a way that it can be described in translations, rotations, reflections and glide reflections.

34.6 Conclusion

This study concludes that *songket* fabric consists of a well-organised design in its complex, elaborate motifs and patterns. Moreover, it is found that *songket* pattern can be classified along the principles of symmetry and transformation. This study's analytical emphasis on the mathematical approach can be found in the sections of a sarong or in the shawl such as in the *kepala kain*, *badan kain* and *punca kain* (end

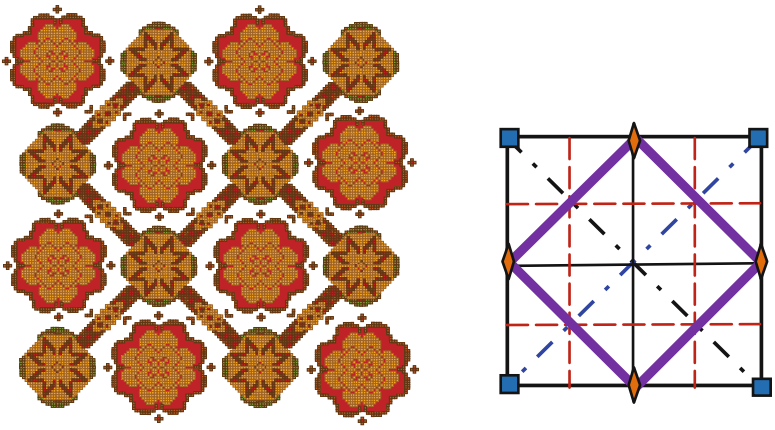


Fig. 34.11 The body of the *sarong songket* section consists of four motifs which are arranged in *teluk berantai* pattern or in groups of *type 11 p4m.* These repeats refer to one of the 17 wallpaper patterns which the pattern flips in four directions, half turns and quarter turns

Fig. 34.12 *Kain limar bersongket* with songket motifs woven onto the weft ikat background. The pattern is situated at the body of the sarong section. The motifs are *tampuk kesemak*, *bunga bintang* or *tapak sulaiman* and *buah tamar* (dates)

cloth). The designers of *songket* are mainly Muslims, and they design the patterns on the concept of infinity, where the motifs are beautifully stylised and executed in repeated patterns from the vegetal with no beginning nor ending. However, the patterns are repeated within the given space in different sections of a sarong or a *selendang*. As a matter of fact, God has given us alternative ways to design patterns away from human, animal or idol forms and figures. Therefore, in the Islamic design, the patterns are repeated in many ways and create interesting shapes of motifs with harmony and balance in the *songket* design.

Fig. 34.13 *Songket* sarong with motifs of *bunga mahkota raja* designed at the *kepala kain* section with *teluk berantai* pattern

Fig. 34.14 This *songket* pattern in type 11, p4m, which refers to flips in four directions, half turns and quarter turns

Fig. 34.15 *Selendang* or shawl with motifs of *pucuk rebung tepi gigi yu, bunga semangat* and *bunga pucuk* (flower bud) at the end cloth of the shawl

Fig. 34.16 *Songket* of *bunga pucuk* motifs arranged in type p2 wallpaper pattern

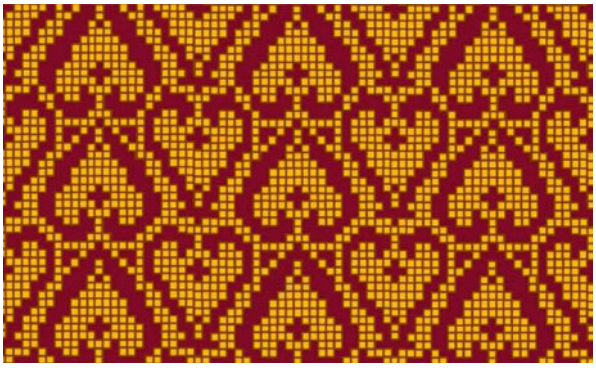


Fig. 34.17 Detail design of *bunga pucuk* with its motif facing up and down alternately at the end cloth of the shawl. The motifs are arranged in half-turn repeats

In this research, it has shown that the pattern in *songket* could be studied in transformational geometry that can be found in either the frieze and wallpaper pattern which is used by many researchers on other studies of analysing designs. There are many more *songket* patterns that are yet to be analysed; as such, the study on this matter must be continued.

It is hoped that the results of this study in classifying *songket* in mathematical approach will benefit the textile designers on how the *songket* pattern is designed

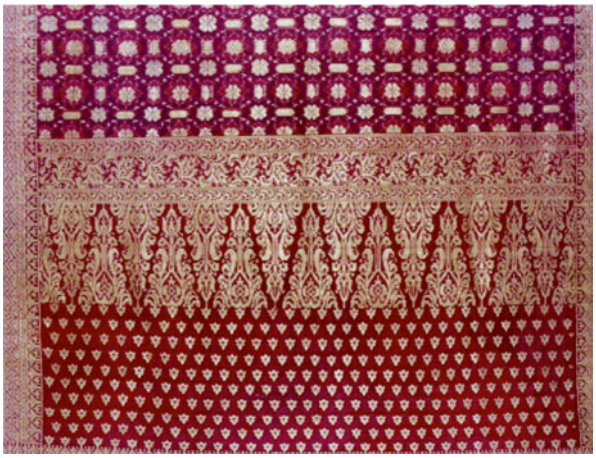


Fig. 34.18 A *limar bersongket* shawl with *corak bertabur* or isolated motifs at the *badan kain*, *bunga ati-ati* at the *pengapit kain* and followed by *pucuk rebung lawi ayam*, *bunga pucuk* motifs at the end cloth of the shawl

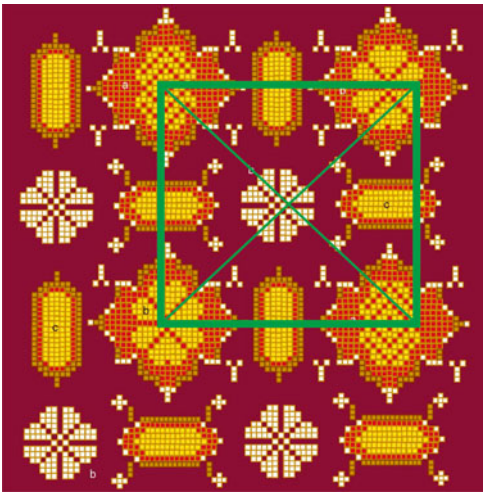


Fig. 34.19 Detail design at the *badan kain* of *limar bersongket* arranged in type 11 (p4m). The motifs are *bunga tampuk manggis* (mangosteen), *tampuk kesemak* (sharon fruit/ persimmon) and *buah tamar* (dates)

and calculated. This finding could also benefit the researchers, designers, museum curators and textile collectors on the knowledge of its design and pattern in symmetrical group classifications.

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Chapter 35
Conceptual Labyrinth Pattern Design for Ceramic Stoneware Art Form

Nur Jannah Jamil, Norhanisa Hamran, and Verly Veto Vermol

Abstract Since ancient times, the labyrinth has been commonly used as puzzles. The labyrinth consists of selections of pathways which are separated by a number of walls that lead to multiple directions. Patterns that project through labyrinth walls conceived an interesting value in an aesthetic concept especially in developing ceramic decoration. Ceramic is a design topic encompassing a broad, rich, and varied body of work. Therefore, combining the concept of the labyrinth in ceramic design creates a decoration which appears not only in two-dimensional (2D) form but also in three-dimensional (3D) forms. These designs will be experimented through technical problems and brainstorming process of creating a moderated design.

Keywords Ceramic art form decoration • 3D design • Technical

35.1 Introduction

The labyrinth-maze concept is a fun and interesting game. The maze is different from the labyrinths because maze consists of several branches and destinations while labyrinth contains of a single pathway separated by a barrier that leads to one destination [1]. Conferring to myth, this kind of intricate structure is built for King Minos of Crete, Knossos, by Daedalus, which was used to hold an ancient creature at that time. Labyrinth design nowadays has been used in building construction and sculpture, for example, the building situated at the north of Egypt was built more than 2,000 years ago [2]. Labyrinth in art symbolizes physical and spiritual elements. There are hidden messages in every expressive artwork presented. Through

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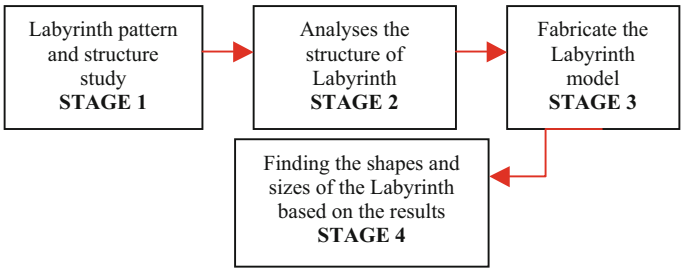

Fig. 35.1 The conceptual framework chronology

the centuries, painters and writers use the labyrinth by transfiguring them from the negative to positive elements [3]. A long time ago, this theory was also being used in developing structures of a building. Modern authors such as Ayrton and Borges were inspired by the labyrinth myths that were represented as human symbol for the past 5,000 years ago [4]. Labyrinth also has a different kind of pattern and shape. Labyrinth includes geometric and organic form (refer to Fig. 35.1).

Ceramic arts can be versatile and exist whether as functional or nonfunctional products. Nowadays ceramic design are often focused on function purposed [5]. The materials in ceramic are important not only for industrial purposes but also in producing sculpture and art form. The labyrinth-maze design elaboration in art form is still in minimal stage. This design is not usually used by designers since the form of a labyrinth-maze is mostly created in two-dimensional (2D) manner. Throughout the discussion, this paper proposed a conceptual design in the development and evolvement in consubstantial of labyrinth in ceramic art form in the process of enhancing its aesthetic value on modern ceramic art form. The development of a prototype will focus in finding labyrinth design that can be applied in ceramic art form. The objective is to determine the potential of this exquisite pattern to be applied in industrial ceramic design.

35.2 Methodology

To improve ceramic art form decoration, it is necessary to identify the possible critical situations; then steps should be made to upgrade the labyrinth concepts in 3D design. This research covers four stages of developing the labyrinth decoration.

At the early stage, the design forms proposed are simple yet modern. During design brainstorming, data are produced by studying the elements of avant-gardism in design, decoration suitable with the current situation. Then, study the pattern and structure, and observe the gradient of the labyrinth pattern. In the second stage, analyze the structure of the labyrinth and calculate the gradient and the sizes of the structure. The size must be parallel to support the path size. On the fourth stage is the fabricating process of this art form referring, the calculation has to be controlled

in three different stages; drying, bisque fires, and glaze firing. This study will be using the material of stoneware ceramic; these particulars need to be taken to ensure there are no defects to the art form.

The author used two types of firing including bisque and glaze firing. For bisque firing, the product will be fired on temperature 900 °C. This firing function is to remove water content of the ceramic body slowly. The temperature should not rise up too fast to prevent the ware from breaking which is caused by heat going out through the body [6].

In design investigation, the product design has been segregated into three (3) sets, which form circles with the same diameters and sizes. These three parts are separate and can be joined with each other using a plastic pipe located beneath them. These forms are labeled with specimens A, B, and C.

For design A, by using thread to sketch the spiral form, one end of the thread will be tied at the end of a stick and rolled counterclockwise while the opposite end of the thread is tied to a pencil. To start sketching, the pencil is turned slowly in a clockwise direction until it is done (refer to Fig. 35.2). Design B used a simple labyrinth pattern, zigzag. This design consists of four partitions which separate from each side. Every partition consists of a specific length, which enables the marble to pass through (refer Fig. 35.3). Design C used the combination of zigzag and steps (refer to Fig. 35.4). This design is randomly made to create a natural flow of the pattern.

After inserting the technical measurement and drawn in the 3D solid works software, the design is formed on molded. In the fabricating stage, a porcelain body is used as raw material and cast for every single design for 25 min to get the thickness

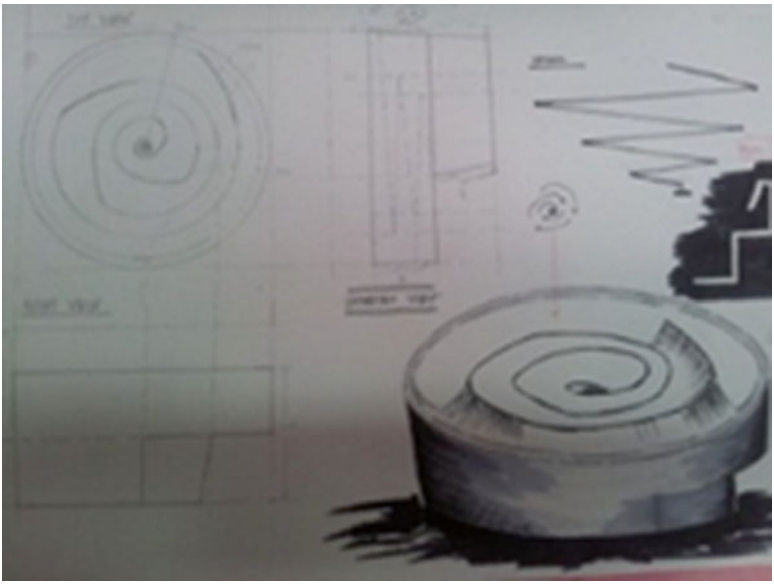

Fig. 35.2 Study on form development through sketches

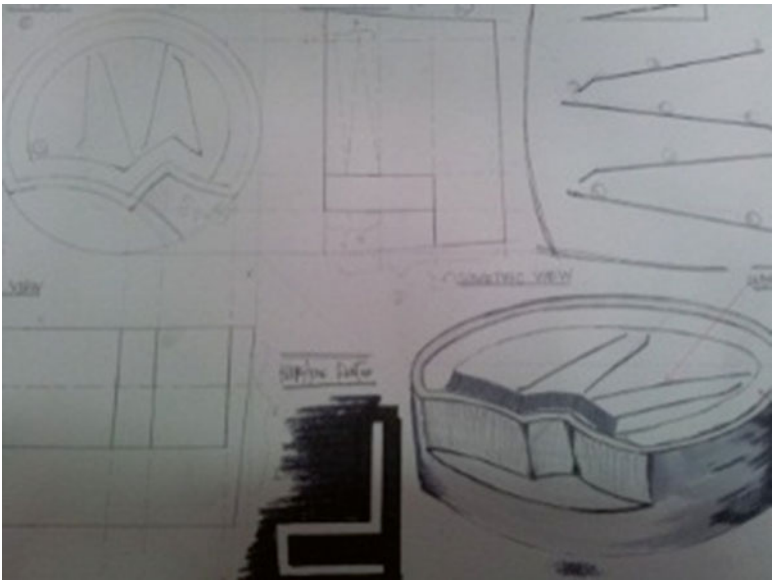

Fig. 35.3 Thickness illustration to investigate the possibility of warpage

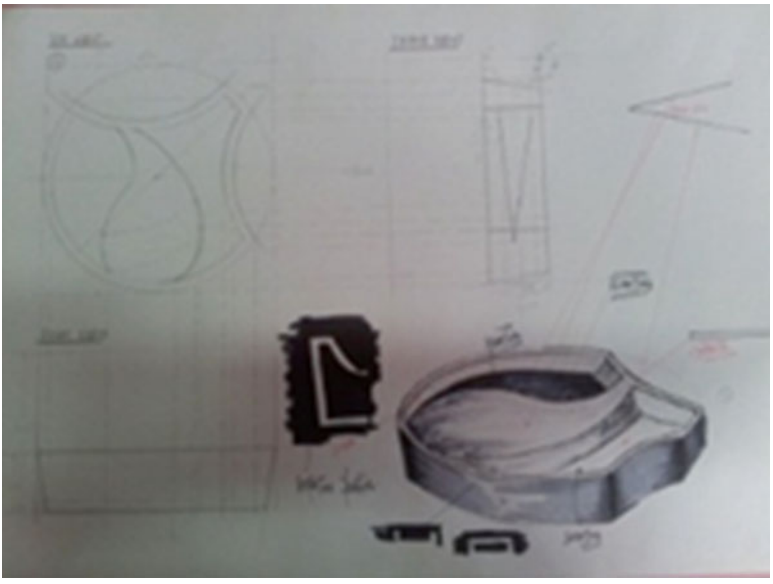

Fig. 35.4 Illustration on technical drawing on the form

of around 7 mm and then fired to 1250 °C. The final form of the designed labyrinth pathway is then examined by marble rolling to ensure that each pathway is parallel and leveled.

35.3 Results and Discussion

A pilot test is done on the gradient of specimens A, B, and C. Figure 35.5 shows the graph of speed against time and distance against time. The author has made a test on gradient of specimen before producing the mold. Speed is actually influenced by the angle of gradient [7].

The speed of the marble on the specimen relies on the height of the gradient. The speed will be increased if the height of gradient increased. The analysis shows that the gradients influence the movement of marble on the art form. A combination of three parts of the design makes the marble flow more interesting.

The designed labyrinth pattern has been added to show and creates creative movement of marble on an art form. Based on this art form, it is found that several problems occur especially regarding mold making. For this specimen, there will be two pieces of mold, the top and the bottom. The author made a spare and tiny hole above the mold. This is to pour out the waste slip from the mold.

During the casting process, the slip does not stick completely on the mold because the slip is too concentrated especially during casting. By removing the waste slip outside from the mold, the slip will be pulled out together. This causes the wall to collapse and unwanted texture of slip produced by the concentrated slip. To overcome the situation, calculate the specific gravity of slip.

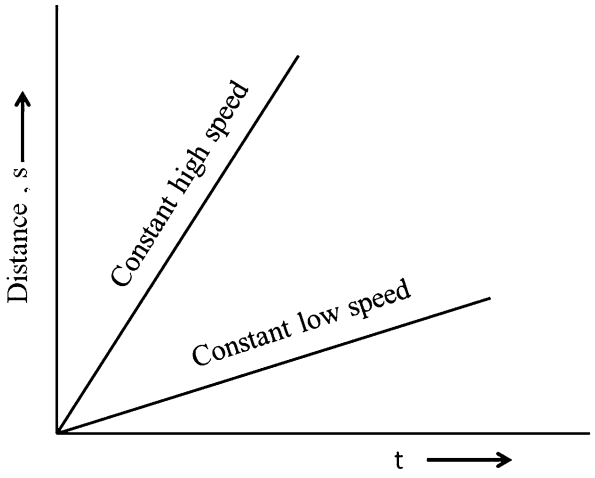

Fig. 35.5 Graph of speed against time and distance against time

Fig. 35.6 Fabricated ceramic artwork with labyrinth design pattern

The measurement should be around 1.740–1.780. Sodium silicate was added to control the viscosity, making the slip more liquid. Figure 35.6 shows the equation of *specific gravity*:

$$\text{Specific gravity} = \frac{\text{Mass}}{\text{Volume}}$$

35.4 Conclusion

It can be concluded that the combination of contemporary ceramic form and labyrinth theory can create innovative design through the study of the pattern and structure of labyrinth and maze. Moreover, this concept provides benefit especially in developing our knowledge in solving problems. The gradient plays a main role in moving the marble on the art form. The movement of the marble from the upper part to the hole of the lower part is controlled by the labyrinth concepts, the center of the design.

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Chapter 36
SCAMPER for Character Design Unique Zoo Creature

M.C. Yuen, N.S. Tarique Azam, and K.Y. Ang

Abstract Creating a memorable and suitable character design for storytelling can be a challenge for students. While most of the students' design is influenced by media, cultural background, popular trends and ideas, the students attempt to add originality to clichéd character design to create a unique character for animation. Generally, students go through the pre-production process to generate ideas for character design, starting from the preparative stage to the generative stage of ideation and visual design. Equipped with brainstorming and mind-mapping thinking skills, this research studied the use of the SCAMPER technique in order to help students further explore and create original ideas for character design. SCAMPER is an idea generation technique pioneered by Robert Eberle; it's an acronym for Substitute, Combine, Adapt, Magnify, Modify, Put to another use, Eliminate, Rearrange and Reverse. Thirty-two animation students taking Creative Studio in Dasein Academy of Art participated in the study. The theme unique zoo creature was given to the students for the study. After applying the SCAMPER technique in their ideation process, students managed to quickly generate ideas for unique character design with added originality.

Keywords Character design • SCAMPER technique • Idea generation

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36.1 Introduction

"A good character design is a character that is memorable, believable and right for the story" [1, 27]. In creating such a character design, there are no effective formulas to achieve the outcome. Different designers approach character design differently. Most designers will design according to their own personal preferences and experiences, taking into consideration their cultural background, existing and precedent studies as well as popular trends and ideas [2]. For example, in the Malaysian classroom, students tend to design characters based on anime and Disney influences due to the media exposure (Figs. 36.3, 36.4, 36.5, 36.6, 36.7 and 36.8). Though there are no clear classification of character categories, basically characters are categorised as living and nonliving characters. Examples of living characters are human, animals and anthropomorphic living objects such as plants and creatures. Nonliving characters include anthropomorphised dead objects, natural elements, mythical and mystical entities or even machineries. Nonetheless, referring to designers' blogs and character design book publications, most character designers stressed on the genre and character descriptions in the story [3–19]. For example, role-playing game character design is based on game character classes such as warriors, knights, mages, rogues, etc. [13], while myths and classical story arcs are based on the character archetypes as described by Vogler [20].

To create a unique character is difficult as someone somewhere has probably created it the same way [3]. According to the Merriam-Webster dictionary online, the definition of unique is *being the one and only* [21]. Most of the time, instead of being unique, character designs end up as clichéd designs, looking like designs that other designers have created. Clichéd designs may look boring, but they are the norm and have been prominently defined over the years. The advantage of a clichéd design is that it makes the characters instantly recognisable and provides familiarity to the characters [14, 22]. Regardless, the way to break away from clichéd designs is to add originality to the character design [3]. Designers may add a twist or the +1 factor to an existing character [3, 22]. Taking one of the examples in Li's study on Street Fighter character designs by Capcom, Guile as shown in Fig. 36.1 is a clichéd soldier design with a unique hairstyle that renders it as the character's trademark.

36.2 The Character Design Process

However, understanding the need for originality in character design is the first step in good character design. The character designer will go through two stages of design process before the character design is completed. As shown in Fig. 36.2, the two stages of character design process are the preparative stage and the generative stage. After defining the problem statements and research is done in the preparative stage, designers will move on to the generative stage where ideation begins. This is the stage where visual designs are created based on the studies in the preparative stage.

Fig. 36.1 Guile, retrieved from http://www.fightersgeneration.com/characters/guile-mv2.jpg

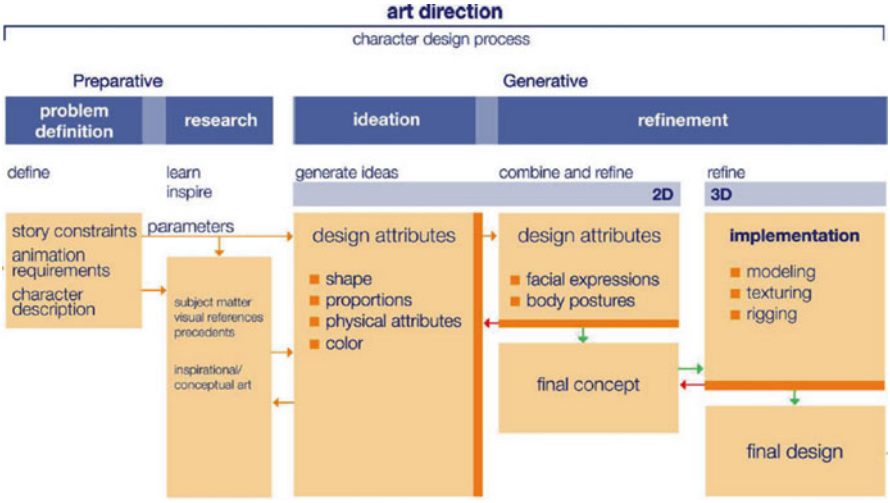

Fig. 36.2 Character design process model by Lioi (2009) [2]

Ideation Technique

In character design, few techniques are popular in generating ideas for creative design. In the context of this study, students were equipped with the following creative thinking techniques:

- Mind-mapping – a spidergram popularised by Tony Buzan to visualise ideas and information through listing and linking [23].
- Random juxtaposition – one of Edward de Bono's lateral thinking technique that uses provocation to incite creative and wild ideas by placing two unrelated random words side by side for comparison or combination [24].

This is the first time the students have known of the SCAMPER technique. Students were usually lost after brainstorming not knowing what to do with the information they listed down. Therefore, the SCAMPER technique is introduced to the students to further generate ideas. The SCAMPER technique is a "checklist"-type creative thinking tool initially developed by Eberle [25] to help the children easily tap into their natural creativeness [25]. Table 36.1 lists the fundamental elements of the SCAMPER technique used. According to Eberle [25], SCAMPER is sometimes also known as SCAMMPERR as each of the seven letters is also the initial letter of word phrases making up the checklist used to create the SCAMPER where the word M can also be used for modify, magnify and minify[25]. The SCAMPER technique uses a set of directed, idea-spurring questions to suggest some addition to, or modification of, something that already exists [25]. It is direct and easy to understand, which somewhat applies to character design.

It depends on the situation where the students will need to identify which element should they use for their studies and design to suit the outcomes. The SCAMPER technique is proven to be an effective tool for the design students according to Lim: "That is very clever……In this way an idea can be quickly generated and ready to be refined and modified to suit the need for the current design situation"[26].

Table 36.1 SCAMPER technique breakdown

	Description
S	Substitute (e.g. components, materials)
C	Combine (e.g. mix, combine with other assemblies, integrate)
A	Adapt (e.g. alter, change function, use part of another element)
M	Magnify/Modify/Minify (e.g. increase or reduce in scale, change shape, modify)
P	Put to other uses
E	Eliminate (e.g. remove elements, simplify, reduce to core functionality)
R	Rearrange/Reverse (e.g. turn inside out or upside down)

Design Attributes

After character development has been completed, designers proceed to the ideation stage where sketches are made. In the ideation stage, designers look into shapes, proportion, physical attributes and colour for character design:

1. *Shapes:* having different shapes and recognisable silhouettes helps distinguish characters from each other making the characters easily readable and interesting [1, 4, 8, 9, 11, 14]. Basic character shapes are made up of elemental closed forms of the circle or oval, the square or rectangle, the upward triangle and the downward triangle [8, 9, 11] of which indicates straight or curve sides dominant masses in the character [4]. For example, cute characters would have a more rounded and stunted shape; goofy characters tend to be curvy with stretchy body parts, while pugnacious characters are usually angular with a heavy top [5]. Caricature is a good way to play with proportion of the shapes.
2. *Proportion:* the stylisation of the character design is reflected in the proportions of the characters. Realistic character designs are based on the general human body proportion of adult's head to body ratio of 1:8–1:11, while proportions of a child and caricatured, cartoony, cute or abstract characters are altered and exaggerated with a ratio of 1:2–1:5 [1]. A character line-up is needed to show how each character sizes up against each other and ensure physical and facial proportions of the characters, be of the same world in the same story setting and accommodate how character will interact with each other physically and emotionally [4, 17].
3. *Physical attributes:* refer to appropriate details to the character to make it believable ranging from facial features to props and costumes as well as any details, such as texture, patterns, etc. [2].
4. *Colour:* creates appeal to the audience [3]; colour creates mood, defines the character in the story and establishes a relationship between the character and the background, supporting the unity and recognition of the character's silhouette [2, 11].

However, this study focused only on shapes, proportion and physical attributes of the character design.

36.3 Methods

In order to help animation students generate ideas for good character design, an exercise is given to four batches of animation students undertaking Creative Studio course at Dasein Academy of Art. A total of 32 students took part in the study. As a quick exercise in the classroom, the students were briefed and given 15 min to design a "unique zoo creature that would be the main attraction to your new zoo". The zoo creature theme was given to the students so they can have a wider exploration of animal species type as compared to human characters. The students were only required to design a single character with fast sketches and justified character descriptions. Colour design was not required in the exercise. After 15 min the

students presented their designs followed by discussions and critiques. After getting feedback from the instructors and peers, the instructors briefed students about the SCAMPER technique. Students were then given another 15 min to design another unique zoo creature. Presentation, discussion and critiques followed suit after 15 min. The designs before and after the SCAMPER technique was applied were then compared and analysed.

36.4 Results and Discussion

Pre-SCAMPER

The students brainstormed and illustrated one zoo creature within the given time. Figure 36.3 is an example of a mind map generated by a student during the ideation process. Some attempted to illustrate the character in various angles. At the end of

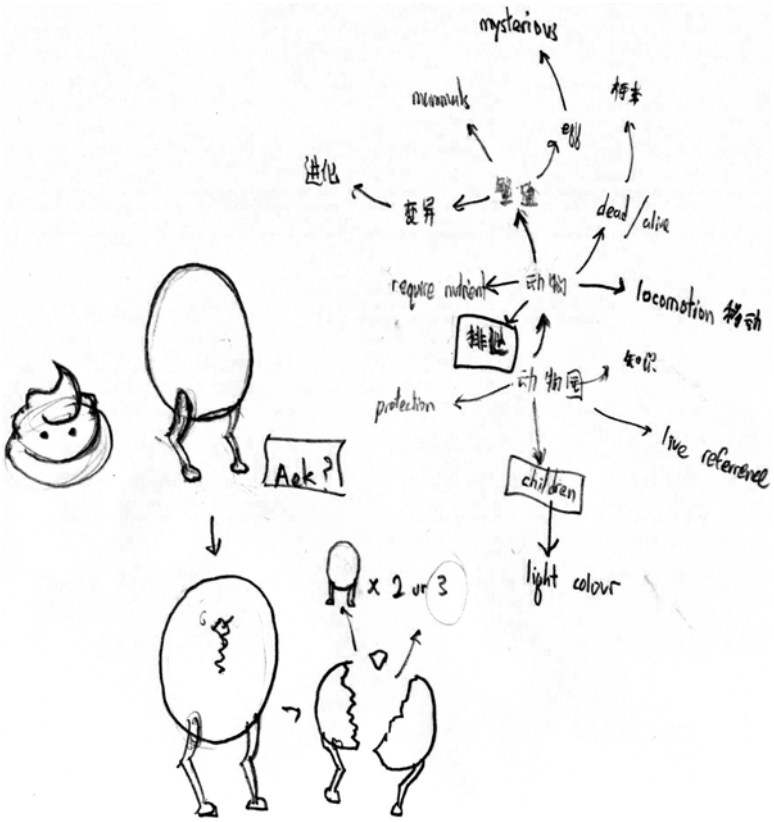

Fig. 36.3 Mind map for character design on an egg-like character

the given time, students presented their design to the class along with their back story, and feedback was given by peers and the instructor. In the pretest, cliché characters were observed from the students. The characters that the students created are either real world creatures or fantasy creatures from legends and folklore or influenced from popular media. Some of the real world creatures illustrated are the lion, hornbill, snake and chameleon (Fig. 36.4); other fantasy characters include the dinosaur (Fig. 36.5), the Chinese vampire and the Chinese dragon (Fig. 36.6), Pegasus and unicorn (Fig. 36.7), nine-tailed fox and winged lion (Fig. 36.8). At this stage, students' designs are fragments of their memories of creatures that they have seen before, creatures which are interpretations and creations of past and existing designers that the students think fit the theme given to them. Nonetheless, the students did fulfil the design requirement but failed to create a character that is original and imaginative. On the surface, the designs are believable and right for the story but are not memorable.

Fig. 36.4 Realistic animal design

Fig. 36.5 Dinosaur design with Disney influence

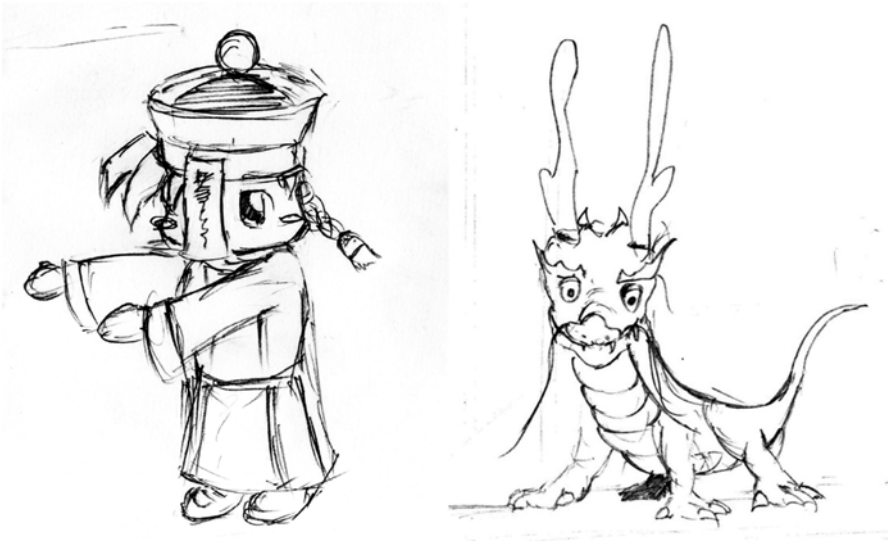

Fig. 36.6 Chinese cultural influence in character design, the Chinese zombie and the Chinese dragon

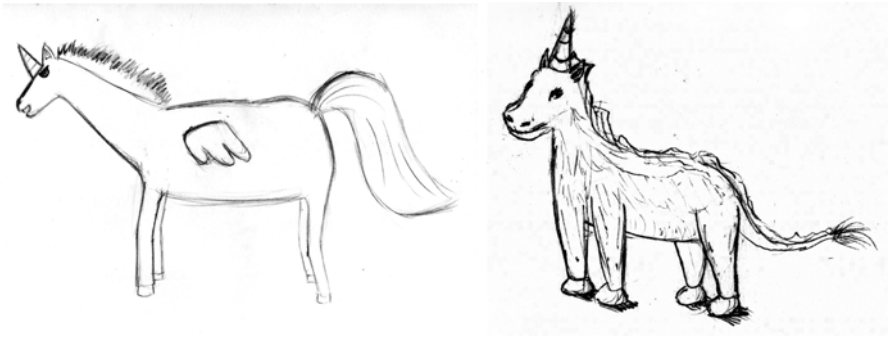

Fig. 36.7 Influence of fantasy in western culture: the unicorn with and without wings

Fig. 36.8 The nine-tailed fox and winged lion influence from the Japanese folklore and anime

Post-SCAMPER

After learning the SCAMPER technique, students were able to create designs that were less clichéd with more confidence. Figures 36.9, 36.10, 36.11, 36.12 and 36.13 are some of the students' character designs using the SCAMPER. Though some students were still unable to grasp the SCAMPER technique, majority of the students managed to apply the technique in their design, using one or a combination of a few techniques. Figure 36.9 shows a design of adapting the kite characteristic into a koi fish and a deer with fur that represents the flower bush.

The techniques that most students found easiest to apply in the idea generation process are the Combine and Magnify/Modify/Minify technique. As shown in Fig. 36.10, a rabbit is combined with magnified octopus tentacles, while another creature is combined with a rhino horn and seals' limbs with modified tail design. Combine technique is also common in existing fantasy character and creature designs, e.g. the unicorn is a horse with a horn and the Pegasus is a horse with wings.

As opposed to the majority, a few students applied the Eliminate technique. Figure 36.11 shows two character designs of a dog and a bird. The number of body parts is reduced and eliminated to create an odd but interesting character. The Eliminate technique is commonly applied to create minimalistic characters. The bird's beak is eliminated in Fig. 36.11, whereas Adaptation is common especially in anthropomorphising non-human characters.

At a glance, character designs in Fig. 36.12 seem unrelated to the theme given; however, the students insisted that the creatures belong to a futuristic time set where mutation and machinery have overruled the animation kingdom. These designs applied the Put to other use and Rearrange/Reverse technique.

In the previous sections, it is recommended that designers add a twist or a +1 factor in the design to add originality to the design [2, 3, 22]. Adding more than a

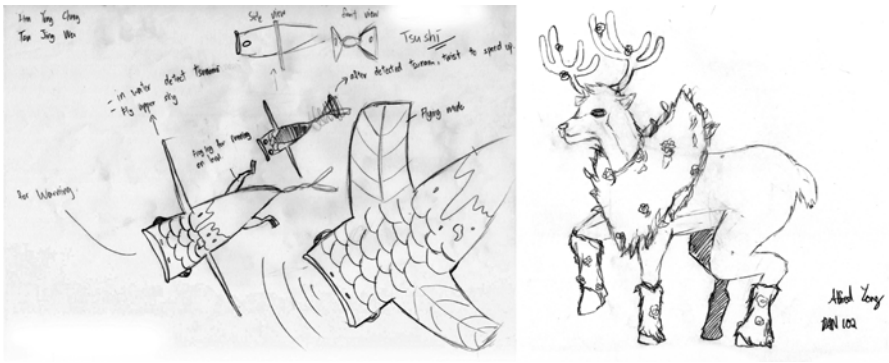

Fig. 36.9 Character design using Adapt technique

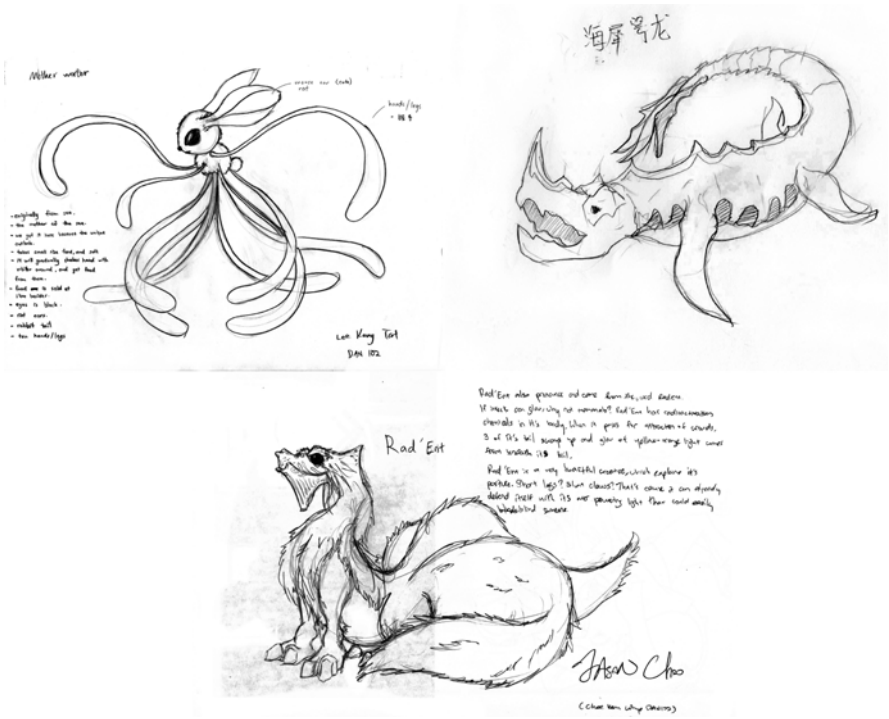

Fig. 36.10 Character designs with Combine and Magnify/Modify/Minify techniques

twist might be detrimental to the character design. Having applied too many SCAMPER techniques rendered the character similar to a monster as it loses the focus in the design and somewhat confuses the audience on the design of the characters as shown in Fig. 36.13.

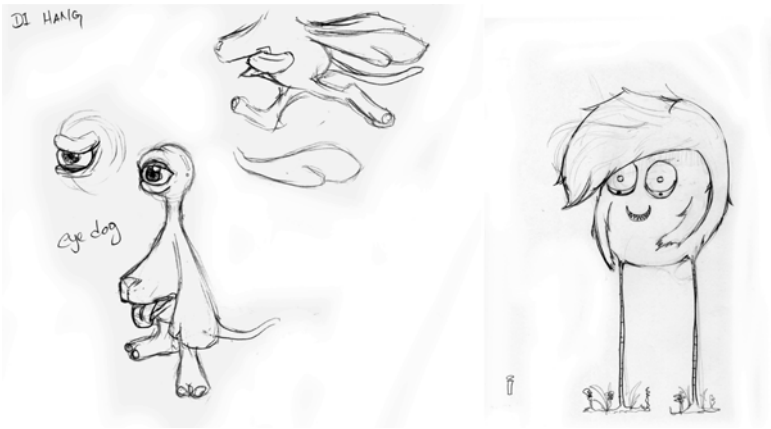

Fig. 36.11 Character design applying Adapt, Eliminate and Magnify/Modify/Minify techniques

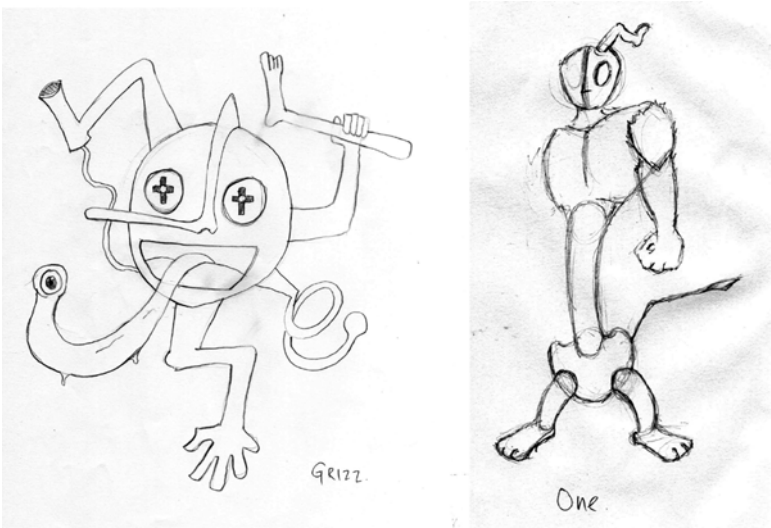

Fig. 36.12 Character design applying Adapt, Put to other use and Rearrange/Reverse techniques

On another note, most of the characters designed by the students applied oval and round shapes, with mixed proportion design. Few also managed to apply appropriate physical attributes to the design to make the characters more believable, e.g. characters in Figs. 36.9 and 36.13.

Fig. 36.13 Character designs with four or more SCAMPER techniques applied

36.5 Conclusion

This study focused mainly on using the SCAMPER technique to generate ideas for zoo creature character design. The SCAMPER technique provided students with more direct method of character design added on to their existing knowledge of mind-mapping and random juxtaposition. Students were able to come up with wild imaginations of a unique zoo creature design quickly after going through the SCAMPER technique. Most students use Adapt, Combine, Magnify/Modify/Minify and Eliminate in their design process.

As this study is limited to quick ideation process, it only looked at single character without colour design. The students were not given time to do research and develop conceptual art. Students should be given more time to develop and design characters to fully fit the story. Should the students go through the preparative stage thoroughly, they might be able to have a different outcome of the character design.

Though good drawing skills are helpful in visualising the ideas of the character design however, character design is not all about drawing and rendering. Students

may still create good character design with weak drawing skills; weak character design will still falter with good drawing skills.

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Chapter 37
Framework Muwajjah as an Islamic Art Decoration Through Formgiving Process

Rosmahani Mat Hussain, Rusmadiah Anwar, Muhamad Fairus Kamaruzaman, and Rafeah Legino

Abstract Koran is a manuscript to learn the art of excellence in Islam. It is believed that the pattern decoration and illumination in the Koran began in the first century of Hijrah. During the era of Safavid in the sixteenth and seventeenth centuries, decorative art in the Koran has reached the highest of artistic achievement values. In Islamic art, the manuscript also has its own art called Muwajjah pattern. As time goes by, the Muwajjah pattern decoration became less prominent in Islamic art. Hence, this research aims to explore the elements and assimilate pattern decoration in 3D form by taking into consideration the formgiving method design to characterize the Islamic art. Moreover, using Muwajjah concept can be used as haptic learning for the blind by tactioception to learn about Islamic art decoration through formgiving process. Thus, not only the normal can see and recognized the Muwajjah pattern but also appreciated by the blind society. The research design process involves studying the related literature review on Muwajjah pattern decoration in order to understand the story behind the design. An observation on Muwajjah decoration and a few interviews with Islamic Art Museum officers and the experts in Islamic art were conducted to gain their feedbacks on this research and have a clearer view on the data collected. The intention of this research is to achieve the splendor in Islamic art through the influence of Muwajjah pattern decoration and its potential to be adapted into 3D form.

Keywords Muwajjah pattern • Islamic art • Formgiving

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37.1 Introduction

The script written or copied by hand is called manuscript. Koran is a manuscript in Islam that serves as a guide for Muslims. However, in ancient times, the production of manuscripts is based on demands and offers. The manuscript of an Koran was collected and compiled by Zaid bin Tsabit in Arabic words with 30 constituents. Moreover, the manuscript also has its own art called Muwajjah pattern in Islamic art. Muwajjah is a front page of manuscript that is full with ornament and the most beautiful drawn by mudhahib, the artist in a manuscript.

According to [1] in the Koran Manuscript, Muwajjah is a symbol of the concept and meaning of the light. Islamic art and aesthetics are in a direct relationship with Islamic spirituality. [2] noted that in Islamic tradition, it could be asserted that both religion and art have performed their missions in relation with each other and still remain as autonomous agents. [3] stated that aesthetics in Islamic is the idea of perfection (kamâl) which carries significant importance through aesthetic value. Basically, the illumination in Koran used natural elements such as those that are floral and geometric, and there is continuity in the pattern. Figures 37.1 and 37.2 below show examples of the Muwajjah pattern in the Koran from Ottoman Turkey in 1848 AD/1265AH and 1869 AD/1286AH.

In the sixteenth and seventeenth centuries, decorative art in the Koran has reached the highest of artistic attainment standards in the Safavid era [4]. Nevertheless, Muwajjah pattern decoration is less prominent in Islamic art nowadays especially in Malaysia. Based on the problem statement, the author will explore the elements and assimilate the Muwajjah pattern decoration to achieve the splendor in Islamic art. Furthermore, this framework will introduce the Muwajjah as an Islamic art decoration through the formgiving process. Thus, it can be used as haptic learning which is related to blind society. Haptic communication is a nonverbal way of communicating through the sense of touch. Muwajjah pattern can be used to educate the blind society to learn about Islamic art by taking into consideration the formgiving method

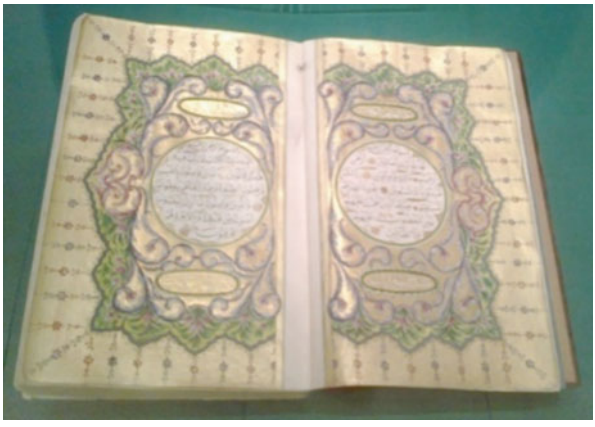

Fig. 37.1 Ottoman Turkey in 1848 AD/1265AH

Fig. 37.2 Ottoman Turkey in 1869 AD/1286AH

design. In addition, normal society can also learn the Muwajjah pattern. According to [5], using the influence of metaphors, meaning, symbols, and signs can transmit formgiving to the aesthetic judgment.

37.2 State of Art

Islamic Art

In Islamic art any visual that copies nature is not allowed. According to [6] visual has no figural images, for instance, three-dimensional sculpture or large-scale oil painting, but instead contains miniatures, vegetal ornaments, arabesque surface patterns, and complex geometric designs. In the Islamic visual art, any figural images are not allowed unless they have been styled or have natural element such as a floral and geometry design. To account for the phenomena, the following radically opposing theories have been offered: the influence of Judaism, the Quranic prohibition against making images, Islamic resentment of the glory of Byzantine icons, logo centricism of classical Islam, the spiritual dimension of Islam, tacit Islamic assertion of "otherness," and contingency of history. Islam does not allow visual that replicates any real-life object unless it comes in stylized form. The manuscript of the Koran might be illuminated with pages or panels of carpet-like decoration, but God's word is never illustrated with pictures. In other words, in Islamic aesthetic sensitivity, perfection, beauty (Jamal), and majesty (jalâl) have a substantial role in terms of aesthetic pleasure and taste. Most of the writers that study Islamic art start to tell about this art through Islam. According to [7], indeed, the way to understand what Islamic art is goes through the understanding of the essence of Islam. In brief, the foundation of Islamic art is the principle of the unity of the fundamental Islamic values. [2] state that, where perspective plunges the viewer into a bounded time, illusory, and mortal space, Islamic pattern evokes timelessness, out-of-time. Because

of the flexibility of Arabic letter forms and the apparent desire of early Muslims to distinguish their culture from those of the people they conquered, the decorative properties of the Arabic script were appreciated and exploited from the beginning of the Islamic era onward [8].

Muwajjah

Muwajjah derived from Arabic words means front page. It is frontispiece of manuscript that most beautiful drawn by *mudhahib* or artist in full ornament. According to [1] in the Koran Manuscript, Muwajjah is a symbol of the concept and meaning of the light. Besides that, the continuity of Muwajjah pattern also can be seen in every page of Koran as a frame. Tazhib or illumination in Koran started on the first century of Hijra. [9] and [10] state that Ali bin Abi Talib was introduced as the *tazhib* in Koran. As time goes by, the Islamic world has evolved and gives a lot of influence in Islamic art. In the sixteenth and seventeenth centuries of Safavid era, the decorative art in the Koran has reached the highest of artistic achievement values [8]. Therefore, there are many influences in Muwajjah pattern. It is illumination art in Koran with a long process for decorative element as it is done carefully. The history of illumination art started on the first Hijrah century, and there are illumination ornaments for reading stop sign and a sign for another surah in Koran [11]. It is handwritten including the illumination using pigment, brush, and reed. Nevertheless, detailed information is yet to be gained regarding the color of dyes and pigments. As time goes by, the Islamic world has evolved and gives a lot of influence in Islamic art. The author realized there are various kinds of Muwajjah pattern. Every Koran has its own Muwajjah pattern, influenced by many countries. In order to differentiate the pattern influence of Koran based on the country it came from, the viewer should first familiarize themselves with the illuminations. Koran is also a type of manuscript. This is because it is handwritten including the illumination using pigment, brush, and reed. Nevertheless, detailed information is yet to be gained regarding the color of dyes and pigments. Cultural interaction, however, takes place, and the work of art was produced from a variety of people, cultures, and tastes. The structure of Koran pages may be different and written in different directions. Moreover, the size of Koran depends on the function such that the big Koran is used in mosque and the smallest is used as amulet by soldiers on the battlefield.

Formgiving

Based on the Norwegian dictionary, formgiving means fashioning, molding in industrial design which is the designer used word for shaping in previously. In industrial design formgiving is concerned with the interfaces of the product, and it merges with concerns about functionality and construction. Formgiving also

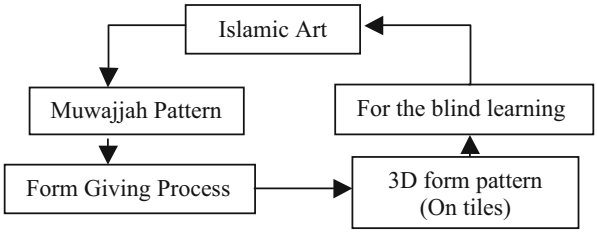

Fig. 37.3 Research design framework on Muwajjah design pattern

concern with surface appearance design of object with the intention that they convey information about themselves [12]. The understanding that the use of basic entities of visual elements (VE) such as point, line, plane or surface, and volume is involved during designing and in generating images and form(s) that are both two dimensional (2D) and three dimensional (3D) becomes evident [5] (Fig. 37.3).

37.3 Methodology

This research focuses on Islamic art, Muwajjah pattern, and formgiving. In Islamic art, the author will study Muwajjah pattern and implement it through the formgiving process on 3D form design pattern which uses tiles. It can be used for the blind in order to teach them about Islamic art. The author makes an observation on the blind education system to understand their learning. Based on [13] statement, to see what happens in "real-life" observations is helpful to understand phenomena, influential variables, or other elementary interrelations. Besides that, interviews with the experts such as the people from the Islamic Art Museum and Islamic experts and with the blind society are needed to collect the information about Islamic art pattern. To gather information from experts in the field, interviews and consultations are useful to understand consumer perceptions, motivation, opinions, and behavior concerning products or services [14].

In addition, the formgiving process will be used to ensure the potential of Muwajjah pattern decoration in 3D forms since Muwajjah is only printed in 2D form and basically can be seen in Koran. Muwajjah 3D form pattern will be implemented on tiles using ceramic materials.

In the formgiving process, the researchers will make mold tiles with the size of 12×12 from plaster of Paris (POP) with 3D Muwajjah pattern design. By using earthenware clay body, press it on mold to acquire the pattern on it. According to http://lakesidepottery.com, to dry the tiles, place it on a wire rack to allow good air circulation. After the drying process, tiles will be bisque fired at 900 °C to make the body hard. In this research, the author will use glossy glaze in the glazing process

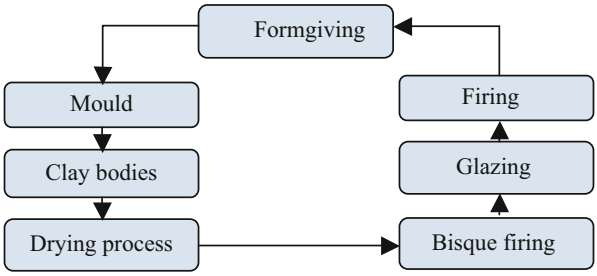

Fig. 37.4 Muwajjah 3D process on formgiving design pattern

to make the tiles smooth so that the blind can focus on the pattern. Lastly, tiles will be fired at 1200 °C in the kiln. Figure 37.4 above shows the example of 3D tiles which is depicted as a 3D Muwajjah pattern. Ceramic tiles can be used as medium to educate the blind in haptic learning.

37.4 Discussion

By using Muwajjah pattern taking consideration of formgiving method design the magnificence in Islamic art will be achieve and can be use as education for blind society to learn about Islamic art in haptic learning. In order to educate them about Islamic art, 3D Muwajjah pattern on tiles will be implemented as a basic learning. Furthermore, the survey will be conducted in various Muwajjah decoration patterns on 3D forms using ceramic tiles in order to get the feedback from the blind society.

37.5 Conclusion

Decorations design is a part of art which combined in the form as well as cultural interaction takes place and the works of art produced from a variety of people, cultures and preferences. It has to be a work of art that is valuable and unique. Therefore, the researcher hope through this framework Muwajjah pattern decoration in formgiving will be accomplished in order to achieve the splendor in Islamic art and can be used for the blind learning.

Acknowledgment The authors would like to thank Islamic Art Museum Kuala Lumpur, Malaysia, for their support in this research. They also give thanks to the Faculty of Art and Design, Universiti Teknologi MARA (UiTM), for the facility and support under the Excellent Fund. This study was conducted in Formgiving Design Research Lab established by Research Management Institute, Universiti Teknologi MARA (UiTM).

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Chapter 38
Furniture Design Identity: Implementation of National Identity into Office Chair Design

Muhamad Fahmi Ahmad, Zakiyah Hasan, and Zulkifli Romli

Abstract Design identity is important to portray a nation and to embrace the cultural values derived from the local design. Countries such as Italy, Germany, and mostly Scandinavia such as Sweden are internationally well known for their design identity which in turn has made each nation very successful in establishing who they are. Malaysia, on the other hand, can be considered as a "young" designer's nation and is still striving on establishing a strong design culture, which is why Malaysian's furniture manufacturers have not produced forms that can be identified carrying a distinctive national identity. Currently, Malaysian furniture manufacturers are still practicing the original equipment manufacturing (OEM) in their designs and productions, and some of them are only doing modification towards existing designs. Thus, this paper will try to discover possible concepts and methods that can be applied to guide Malaysian designers in building a "distinctive" national identity in their design. This research will also explore and investigate the possibility of introducing the National Design Identity guideline toward modern furniture design.

Keywords National identity • Investigate • Implement • Designing

38.1 Introduction

Design identity is an important element in recognizing or differentiating design from all over the world. By having a distinctive design identity, the design will be more unique and embracing sentimental value, philosophy, and style. Currently, Malaysia is still struggling in searching for a design identity in the era of globalization as there is no specific term that can define design coming from Malaysia. Design identity, also known as the DNA in design, can be a method for the designer to develop their design by following some guidelines that had been made in each country. The importance of design identity is to promote the distinction of design style between countries.

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38.2 Methods

The research has been conducted by collecting primary and secondary data. The primary data conducted through open-ended interviews, observation, and experimentation on chosen material, which is plywood, is supported with literature review. Furthermore, analytical testing on mock-up, ideation and development, and drawing is being applied in primary data collection. The design process is supported through mock-up and prototype study, computer-aided design, testing, and prototyping techniques. The challenges in translating the form that portrays national identity are quite complex, and the concept will be derived from the "Cultural Congress" guideline in terms of elaborating the characteristic of national identity. By referring from "Dasar-dasar Pembangunan Malaysia," it has three basic elements:

- The Malaysian National Congress has to follow the original citizens of this region.
- Other related cultures that are relevant and appropriate can be adopted into the national culture.
- Islam is one of the important elements in creating the national culture.

From the criteria, it can be concluded that the original citizens of this region are the Malays or bumiputera culture, and the Malay kite or "wau bulan" is the selected subject matter as a medium that can portray the identity of Malaysia (Fig. 38.1).

38.3 Results and Discussion

In this research, the design criteria and design concept were justified to accomplish a potential design. To elaborate and develop in detail the form and function, it has been categorized into three major elements or criteria, which are aesthetics, technicality, and usability, for research guidelines.

The three main criteria, which are aesthetic, technicality, and usability, make sure that the design development is in proper management and are arranged to generate new concepts for office chair design. The aesthetic value is to discover the physical beauty of "wau bulan" and extract it through the design process. The form and structural elements of "wau bulan," physical form, and function are the aesthetic values that can be developed. The aesthetic aspect is measured by conducting a continuous comparison study on the wau structure and form. The elements have been extracted by brainstorming and discussed with the research team members to create a potential design character.

The technical aspect is to experiment "wau bulan's" characteristics in terms of movement, motive, form, and philosophy and develop it to an office chair design. The "wau bulan's" strong structure and lightweight material are the criteria that can be used in the technical part. Besides, by using local material such as plywood, it can also be considered as an instrument to portray national identity.

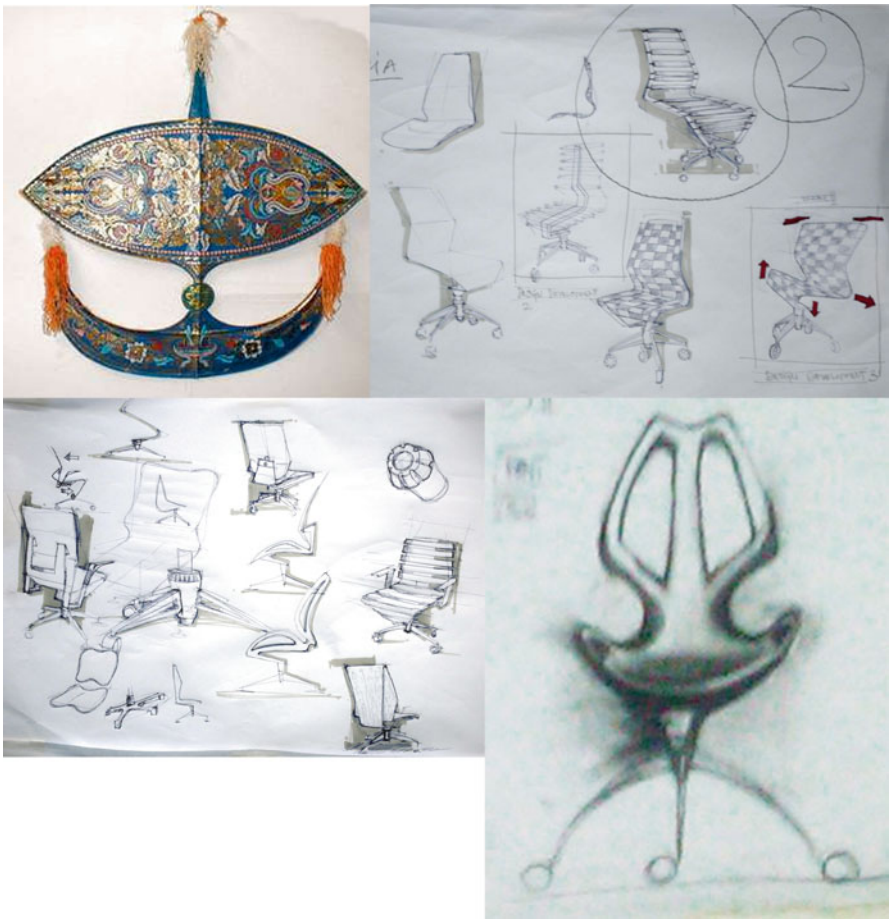

Fig. 38.1 The images of "wau bulan" development and study

Usability refers to the outcome after developing the design combination between aesthetic and technical aspects to apply in an office chair design. The designed office chair containing the style and simple structural elements of the "wau bulan" is a unique way of developing a new trend of office chair. Table 38.1 shows the three criteria and the scope of the study for aesthetic, technical, and usability aspects.

In Figs. 38.2 and 38.3, observation and prototyping conducted from the "wau bulan" form and structure were tested into the prototype model. The design criteria above have been explored and investigated throughout the design process, sketching, ideation process, design refinement, and technical drawing, to achieve the final design that reflects the "wau bulan's" motivations and philosophy. The design is then improved and refined to make sure it reflected the design criteria and objectives.

Table 38.1 The scope of study for the design criteria

Aesthetic	Usability	Technical
Design influence	**Target user**	**Size**
Principle of Malay philosophy of beauty (ethics and spirituality)	Typist, clerk, and general worker	Refers to existing anthropometric data
Form	**Target area**	**Material**
Human body contour	Home, office, studio, classroom	Molded plywood
Linear line		Stainless steel
Cultural form (wau bulan philosophy, form, and function)		Fabric
		Mesh
		Weaving technique
		Fabrication
		Mold making process, clamping, gluing

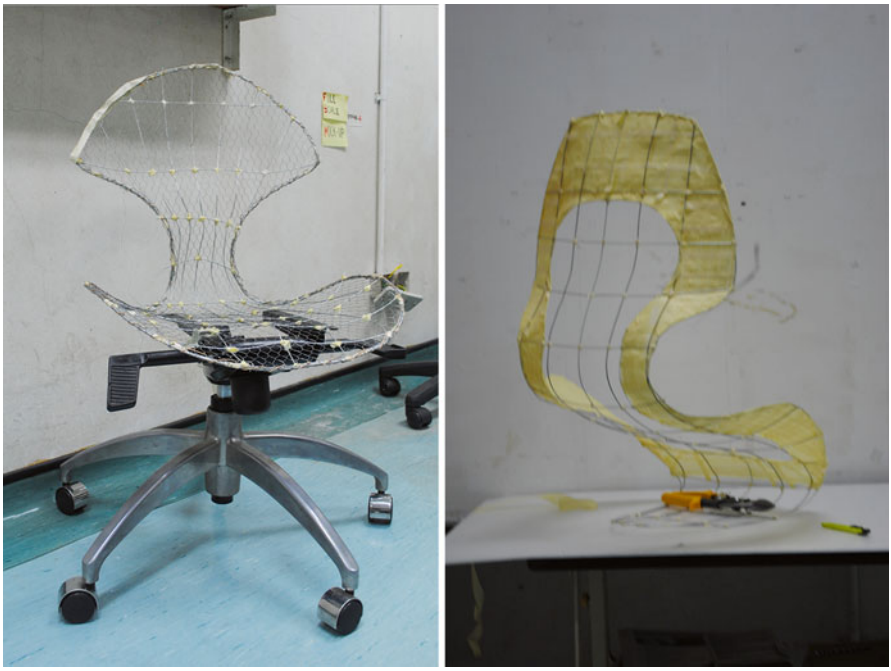

Fig. 38.2 Design development and refinement

Fig. 38.3 Design testing of molded plywood

The ergonomics has also been considered in the aspect of practicality, which is the main protocol in designing an office chair. The simple mechanism which is not using mechanical absorber or system to move the backrest that is also one of the criteria that has been derived from the subject matter and at the same time reduce the weight.

38.4 Conclusion

As a conclusion, the national design identity in furniture design should be derived from our unique cultural heritage to make it different and recognizable. "Culturally derived design" is the best phrase that can be used as a guideline to implement national identity in design. The new knowledge derived from this project is how its form is being studied and it is encouraged to use wire as the main material because it has so many benefits: it is safe and time consuming, among others. Upon testing, to bend the plywood that has some complexity curve, it should be provided with some support on the mold to make sure that the plywood will not break while bending.

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Chapter 39
Designing Conceptual 3D Tessellation Ceramic Optical Illusions

Amalina Azlan, Nurul Najwa Zukri, Verly Veto Vermol, and Rusmadiah Anwar

Abstract This paper deliberates on deconstructivism activities in developing pattern for ceramic relief surface by using an optical illusion as a conceptual element. Today, relief pattern decorations provide insulation and soundproofing that serves as visible and exposed covering of the wall. Wall relief design can be more attractive and meaningful with the combination of tessellated design on their surface through an optical illusion design concept. Optical illusion can be divided into three components which are literal optical illusion, physiological illusion and cognitive illusion through excessive stimulation. It will result in a two-dimensional (2D) optical illusion design limitation to be transformed into three-dimensional (3D) forms; with the application of 2D ambiguity design, 3D with 360° design perspective can be achieved. This study aims to make a new design method in introducing optical illusion applied as a 3D form; hence, a new design concept for optical illusion can be structured. The design methodology will be developed by the division of cognitive mapping, content inventory and design as well as experimental study. As a result, any respondent of designed relief 3D image on a wall will be mystified between the real image and the ambiguous image.

Keywords Optical illusion • Relief pattern • Form • Design methodology

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39.1 Introduction

A wall panel is a single piece of material, usually flat and cut into a rectangular shape, that serves as the visible and exposed covering of a wall. Nowadays, wall panels serve as well a decorative function, providing insulation and soundproofing, using a variety of materials such as wood wool, fibreglass, recycle rubber, plant fibre, polyester, groove woven, etc., combined with uniformity of appearance, along with some measure of durability or ease of replaceability. There is no limit as to the size of the material; it depends on the size of the wall or surface.

The wall panel will be more attractive and meaningful when combined with some patterns on their surface using optical illusion.

Optical Illusion

An optical illusion, which was also known as visual illusion [1], is characterized by showing an image different from the real object. In addition, optical illusions simply trick our brains into seeing things. Optical illusion can be divided into three classifications: literal optical illusions that create images different from the objects that make them; physiological illusions which are the effects of excessive stimulation of the eyes and brain through six specific types, brightness, colour, size, position, tilt and movement; and cognitive illusions are the result of unconscious inferences – the brain makes wrong decision.

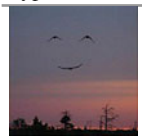
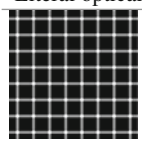
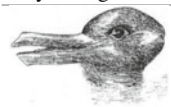
Optical illusion is delusive in nature and is created to manipulate and influence others' stance without realizing it. The problem of this research is that a two-dimensional optical illusion is difficult to convert in three-dimensional form. Optical illusion usually appears in two-dimensional pattern or design and rarely can be seen in three-dimensional forms because of several factors [2]. You can draw impossible objects, but you can't build them because they are outside the laws of nature.

Optical illusion contains elements and principles of design consisting of lines, shapes, spaces/sizes, values, colours and textures. Designers and artists used these elements to innovate and create a new design. The illusionists obeyed all the elements except for the space element (Table 39.1).

Two Dimensional (2D) and Three Dimensional (3D)

Space is used to differentiate a distance of a position, two-dimensional object and three-dimensional object and also the depth of an object. Actual space is a three-dimensional volume that can be emptied or filled with objects. Width, height and depth are the important features of space [3]. Artists and designers used certain cues to create images that are interpreted as three dimensional [4], which are the size and

Table 39.1 Types of optical illusion

Types	Description
 Literal optical illusion	Creates images that are different from the objects that make them
 Psychological illusion	Caused by excessive stimulation of a specific type which are brightness, colour, size, position, tilt and movement
 Cognitive illusion	The result of unconscious inferences

vertical location, overlapping, aerial or atmospheric perspective and linear perspective (http://nwrain.net/tersiisky/design/space.html).

2D means that an object is two dimensional and is lacking the expected depth or range. The object is usually not designed to give any illusions and appears as if it is flat. Two-dimensional objects only involve two identifiable parameters, which are length and height.

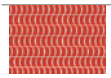
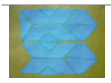
39.2 Methodology

The first method starts with the cognitive aspect that includes awareness, perception, reasoning and judgement which represent construction and accumulation of spatial knowledge, allowing the 'mind's eyes' to visualize images [5]. First, it starts by converting the two-dimensional (2D) forms into three-dimensional (3D) forms of optical illusions. A two-dimensional optical illusion design was never proven in three-dimensional forms because of several factors: they are outside the law of nature and also against perspective rules. To achieve this goal, a few mapping has been done through the theory of optical illusion such as the element and principle, the structure or forms and the arrangement of the product.

The second method is content inventory and design. Content inventory consists of behavioural, attitudinal, quantitative, qualitative, traditional, evaluative and design processes that were initially given to students of arts and design, in different departments [6, 7]. Three students from each department were selected. The following analyses are part of the survey from the respondent's response:

- **Analysis for viewer's first impression**
- **Analysis for viewer's observation towards illusion**
- **Analysis for respondent suggestion**

Table 39.2 Pattern description

Pattern	Description
	The illusion comes from the division of the cone that depicted a modified human face
	The division of this hexagon shape is similar to a modified ladybird
	The third formation adapted from Zollner theory;(3) parallel lines appear diagonal. For this arrangement, the middle empty space between arrow shapes (white area) will appear diagonal if the shape is arranged in large quantities and, even though, it is actually a straight line
	This formation is adapted from Zollner theory; parallel lines appear diagonal. For this arrangement, the horizontal lines will appear tilt if the shape is arranged in large quantities and, even though, it is actually straight horizontal lines
	The illusion comes from the division of the shapes that depicted a structure of a spider
	This formation comes from isometric depth ambiguity illusion. It is depicted in books with separated forms. For this arrangement, viewers may see as open books with pages facing them or as the cover of the books with the spine facing to them
	This formation is adapted from Muller-Lyer's theory; equal length either arrow or fork junction. For this arrangement, the bigger hexagon will appear long in the horizontal line compared to the smaller hexagon even though both are 4 cm in length; it varies in junction types

The third method is an experimental study starting with collecting data, designing sketches and fabricating process [8, 9]. Based on the study of the formation of shapes, it can be conclude that 7 out of 10 formations can be used as a panel, and pattern related to illusion can be applied on the surface of the divided shapes. Below are the formations that closely relate to optical illusion [10, 11] (Table 39.2).

39.3 Result and Discussion

Through the results, we can improvise a new pattern through our understanding. In addition, optical illusion theory can be used as a structure to find new aesthetic patterns that can be applied in three-dimensional products. By creating a quality product, there are several methods that can be applied [11–14], firstly, studies from various resources such as books, journal and the Internet and, secondly, studies of the formation of form and optical illusion pattern.

Analysis for Viewer's First Impression

The respondents were asked to choose their first impression according to the given options. The pie chart above shows that majority of the respondents (53 %) choose illusion as their first impression towards the design, followed by 40 % of the respondents choosing it as a creative design. The lowest percentage is 7 % which is interesting (Fig. 39.1).

Analysis for Viewer's Observation Towards Illusion

The second question is based on the respondent's observation towards anything related to illusion in the design. Of the respondents, 53 % answer that they see the illusion through the spiderweb, whereas 27 % of the respondents see that spider legs pattern related to illusion. Another given answer, through the proportion and arrangement of this product that give illusion effect, carried 7 %. However, 13 % give mixed answers with different opinions (Fig. 39.2).

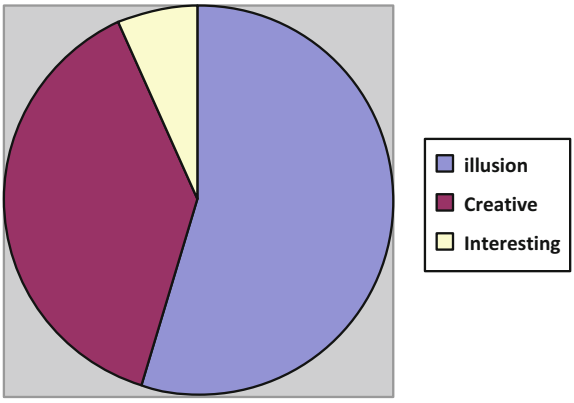


Fig. 39.1 Pie chart 1: percentage of the viewer's first impression

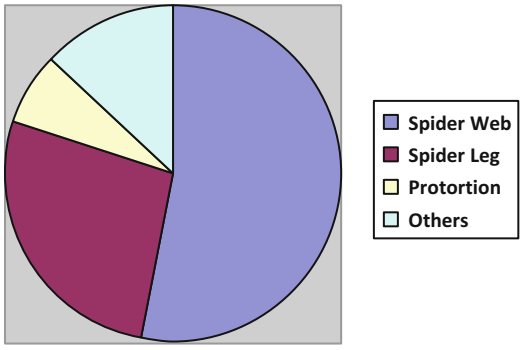


Fig. 39.2 Pie chart 2: percentage of the viewer's observation towards illusion

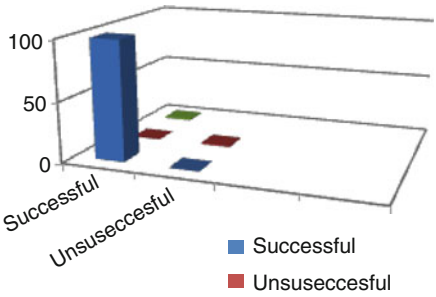


Fig. 39.3 Percentage of analysis for respondent suggestion

Analysis for Respondent Suggestion

The last question is about respondent suggestion towards this product. Only 26 % of the respondents gave their suggestions, such as line will help in illusion and using black and white colour. The respondents were asked to evaluate the level of product's achievement in terms of illusion according to their own opinion. Overall, this product is successful because 100 % of the respondents agreed that this product can trick people's eyes. There are many different reasons given by the respondents such as the artwork looks like two dimensional, but actually it is three dimensional. Another reason is that they can sense the illusion movement from repetition of spider legs. Besides, they cannot distinguish between concave and convex spider legs in top view and also the effect of depth ambiguity in spiderweb (Fig. 39.3).

39.4 Conclusion

From all the studies and surveys that have been done, the results are successful. Based from the case study, it can be concluded that most of the formations created in the previous chapter are fitted to the concept of illusion. The formations that have not reached the desired level in terms of illusion can undergo some adjustment to make the illusion more visible. Angle and eye level are two aspects that play an important role in optical illusion. Without the two aspects, optical illusion may not succeed.

Overall, this illusion is success in the audience's view. All of the respondents have their own opinion towards this product according to distinctive perspective. They are able to identify the trick occurring in the ceramic panel [15]. Also, some of their opinions can be used to improve this product.

Finally, forms and patterns are used to see it as a three-dimensional optical illusion and also to gain an understanding by using two-dimensional optical illusion theory [16].

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Chapter 40
Paper Clay Study Development for Ceramic Art Form Design

Mohd Tazul Akmal Talib, Verly Veto Vermol, Abdul Rahim Jalil, and Rusmadiah Anwar

Abstract Paper clay has been introduced since the last 20 years and was revolted by the European countries. The innovation of paper clay is very crucial to both ceramic artists and researchers. Due to this matter, the development of paper clay is progressive until today. In the realm of ceramic art design study, paper clay is mostly used in ceramic studio and has widely been utilized in sculptures. The combination of paper and clay enhances the level of porosity, nevertheless reducing the overall body weight due to the extension of raw material usage loss [1]. Although paper clay has been used widely in ceramic sculpture and craft, the existence of a number of materials used is very minor. Appropriate study in conducting research and development on the paper clay composition will enable ceramic artist, academician and university students to embark a new technology on developing artwork using ceramic clay. Conventional technique of building a large-scale sculpture often relates to heavy lifting problems. There will be small room of possibility in logistic manner which consequence difficulties of moving the artwork from one place to another. Therefore, the objective of this study is to investigate the suitable parameter of producing paper clay that is lighter than the ordinary clay thus having the potential strength capable of holding its body structure in making large-scale sculpture. Hence, the paper clay will be of commercial value added to existing ceramic material, which enhances ceramic crafts and studio technology. By using an experimental method, the author will identify the suitable parameter for producing paper clay.

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Keywords Paper clay • Sculpture • Ceramic • Raw material • Weight loss

40.1 Introduction

The evolution of ceramic techniques has always been developed and adjusted through time. The involvement of artists and industry makes ceramic upholds boundless possibilities as an art medium. Fibre materials such as paper were used as a new way of exploring ceramic material. The combination of fibre and clay makes it different from conventional clay. In producing large-scale ceramic product or sculpture, its plasticity properties and weight are very crucial. It is an excellent material for a large-scale product due to its significant strength and light weight. Moreover, fibre clay is an economical material because its raw materials come from natural resources and can be obtained from recycled materials [1]. It will reduce cost and energy. Nowadays, industries are looking for alternative and less expensive raw materials and optimizing their processes in order to reduce the amount of waste they produce resulting in a green impact to the environment [2]. Paper clay also withstands rapid temperature changes, which shorten the firing time and saves energy [3]. The capability of the fibre to absorb water is one advantage to fibre clay bodies. Being hollow, fibre clay is a good absorbent and withstands compression and twisting. The clay particles are smaller than the fibre, and it does absorb clay to be dries. Its naturally rough surface enables the fibre to attach to the clay tightly. The benefit of fibre clay is its green strength and lightweight fired body. The strength is predetermined through parameter composition and the type of fibre rather than the amount and quality of the fibre. The production method and firing temperature are significant. Working with fibre clay is easier and more spontaneous compared to the conventional clay. Its distinct natural texture enhances its aesthetic values.

Sculpture

A sculpture is a three-dimensional visual. A sculpture can be produced in many sizes in accordance to the artist's sketches or demand. Ceramic, metal, store, wood and others are used in the production of the sculpture. It depends on how the sculpture artist develops their own product by using their skills [4]. The existence of the ceramic sculpture has been found since before century. It has been proved by the discovery of a ceramic sculpture such as the "Venus of Willendorf", a sculpture that was found by Josef Szombathely, an archaeologist who claimed that the entire ceramic figure from the Palaeolithic age is found in Kermes, Austria. This ceramic figure sculpture was created as a tool of worship for all faiths and as memorial that existed before century until today.

Paper Clay

Paper is one of the fibre products that were produced mainly from fibre materials. Fibre was categorized into two, which are natural and synthetic. Paper is a suitable material to be mixed with clay. Good water absorption is the main reason to use paper. The paper's molecular structure consists of tiny tubes that transport moisture from surface to surface [5, 6]. By using water, it will disintegrate into small particles before mixed into clay slip. The advantage of using paper clays and why some artists have chosen it is because of the strength of the soil which fortifies the mixture of the paper and the clay. Paper clay makes the ceramic work higher and stresses either when it still green ware or dried [7]. It eases the process of finishing before firing. But the body of the ceramic product becomes fragile after the firing process because it produces large pores that appear from the mixture of paper and clay. Paper clay is often used in a large-scale ceramic product, because it is lightweight and accelerates the process of drying. Some of the advantages are its reduced guilt warped, increasing the combined dry clay during and after the process. Roughly, in the production of paper clay, the level of strength depends on the type of paper used and the content of water.

40.2 Methodology

The experimental and laboratory test goal on this research is to investigate the suitable parameter of producing paper clay which is lighter than the conventional clay body including its potential strength of holding its own base structure. Relatively, identifying the suitable parameter of paper clay to produce large-scale sculpture. This research covers three stages of experiment process, which are paper clay process, experiment analysis and design product to achieve the best result of paper clay. Stoneware clay was selected as the main material in this experiment. Stoneware clay is commonly used in ceramic craft and studio sculpture. Stoneware is one of the ceramic clays known as the semi-refractory clay that when fired will produce a dense, vitrified body of high strength [8, 9]. Moreover, it has a strong body before and after firing. In this experiment, we used a ready-made stoneware body obtained from the ceramic laboratory. Table 40.1 shows the standard parameter formula of a stoneware clay body. Tissue paper is selected as the variable additional material to produce paper clay because it is easy to decompose into small pieces and will become a paper pulp. Many ceramicists use toilet paper because it is a very fine milled paper and is easily broken down in the mixing process [10]. It started with the mixing process of stoneware slip and paper pulp mixture including 100 % parameter. The test bars were categorized by different percentage of mixture between paper and clay.

Table 40.1 The standard parameter formula of Malaysia stoneware body

Material	Percent
Kaolin	40
Ball clay	15
Potash feldspar	30
Silica	15
Calcium carbonate	2
Water	45
Sodium	0.3
Specific gravity	1.69

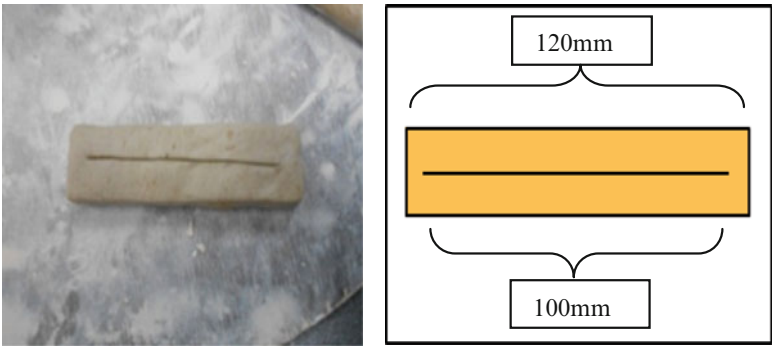

Fig. 40.1 Picture shows standard dimension of the test bar [3]

Table 40.2 The parameter stoneware and paper mixed

Test bar	Stoneware % (g)	Paper pulp % (g)	Total % (g)
A	90	10	100
B	80	20	100
C	70	30	100
D	60	40	100
E	50	50	100
F	40	60	100
G	30	70	100
H	20	80	100
I	10	90	100

The dimension of the test bar is equivalent and standardized. Figure 40.1 shows the dimension of the test bar that was formed by plaster mould casting. The testing process comprises 3 stages which are lather hard, bone dry and firing. There are two different firing temperatures: 900 °C and 1,200 °C. This experiment used 9 different parameters. Table 40.2 shows the parameters of stoneware and paper mixture. These test bars are the result of the size, the level of porosity and strength of the paper clay (Fig. 40.2).

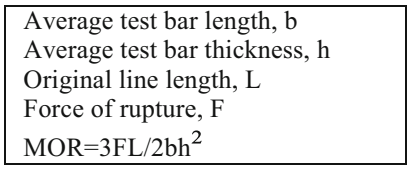

Fig. 40.2 The MOR formula [3]

Table 40.3 Weight of the test bar in four different stages

Test bar	Lather hard (g)	Dry (g)	Bisque firing 900 °C (g)
A	80	55	45
B	78	52	42
C	75	50	36
D	74	46	34
E	73	45	32
F	71	43	30
G	68	42	28
H	65	39	26
I	62	35	24

40.3 Results and Discussion

Table 40.3 shows the weight of a test bar in four different stages. The entire weight starts on 100 g, and it changes after the four-stage process. The weight of the test bar has different numbers because it depends on the amount of water and paper in the test bar. Paper in the clay body will burn off after firing (900 °C and 1,200 °C). Paper is a carbon-based organic material; paper begins to burn into the atmosphere at 45 °C, early on in a firing [11, 12]. The result shows that a higher number of paper will reduce the paper clay weight intensively. The weight of the test bar in lather hard decreased by 20–40 %. Final firing weight decreased from 65 % to 80 %.

Table 40.4 shows the results of data evaluation for the MOR test which was investigated on the test bar. MOR test proved the strength of the paper clay. The strength of the paper clay decreases with every 10 % additional percentage of paper pulp into the stoneware clay. The table proved that the strength of the paper clay sequenced with their parameter. The results come out with different numbers of MOR N/mm. Table 40.4 shows nine different paper clay body strengths. The strength decreased with the addition of paper clay into the stoneware clay. Figure 40.3 shows the graph sequence following the nine different strengths. According to the graph result, paper clay can be used as an alternative in ceramic manufacturing.

Table 40.4 Evaluation result strength of the test bar by modulus of rupture (MOR)

Batch	Average test bar (b), cm	Average of thickness (h), cm	Original line length (L), cm	Force of rapture (F)	MOR N/ mm^2
A	10.5	0.5	8.5	291	4.9
B	10.5	0.5	8.5	195	3.3
C	10.5	0.5	8.5	139	2.3
D	10.5	0.5	8.5	130	2.2
E	10.5	0.5	8.5	89	1.5
F	10.5	0.5	8.5	85	1.4
G	10.5	0.5	8.5	73	1.2
H	10.3	0.5	8.5	59	1.0
I	10	0.5	8.5	56	0.9

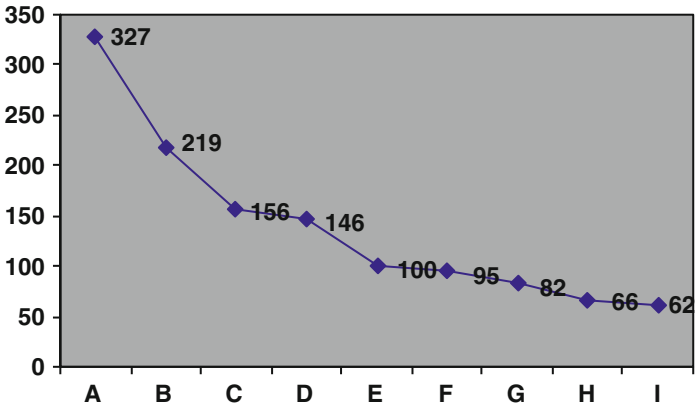

Fig. 40.3 The graph of the MOR strength of paper clay

40.4 Conclusion

This experiment was carried out with satisfactory result and outcome. From the experimental testing by using paper clay, the test bar shows the variable parameters of the paper and clay mixture. A result proved in practice design method. The paper clay is suitable for the manufacture of ceramic design. Moreover, it can sustain the sculpture body and can support large scale by using the paper clay material. In addition, the paper clay also provides a lightweight body and prevents it to collapse or break. In the design process, paper clay is easier to control. On the other hand, the faulty part can be fixed before or after firing. Paper clay will merge the natural textures on the surface. Rough and spontaneous texture makes the sculpture of high aesthetic value. Figure 40.4 shows the formed sculptures by using paper clay before and after the firing process. In the design process, paper clay is more attachable and

Fig. 40.4 The sculpture design in clayware condition produced by using paper clay

Fig. 40.5 Finished paper clay sculpture design

easier to handle when forming or shaping. In this study, the researcher intends to establish paper clay as a suitable material for ceramic craft and studio. Relatively, the installation process of the product will be easier. The development of paper clay is suitable on free-standing sculpture design and wall sculpture design. For further study, the innovation of the paper clay can enhance the ceramic design of the manufacturing sector widely (Fig. 40.5).

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Chapter 41
Corn Husk Fiber in *Songket* Weaving for Cottage Industry

Nani Hartini Ahmad, Norwani Md. Nawawi, Nor Jana Salim, Sarina Mohamad, and Fatrisha Yussof

Abstract Corn husk is the part that covers and protects the ears of the corn, and it is the strongest part of the corn plant as its nature is to protect the seeds. It is found that corn husk fiber has unique properties, such as good pliability, moderate strength, durability, longevity, and high moisture retention, which make it applicable as a songket weaving material. This new songket, made of corn husk fibers, and its craft products have the potential to be commercialized at a cheaper price because the production cost is low. Thus, this creates new demand and a new source of income for the lower-end group in the cottage industry. This production of natural-based fibers from corn husk waste is also eco-friendly and ergonomic. Therefore, it gives many benefits to society toward sustainability of the environment and to the economy in particular. As such, it is hoped that the innovation of corn husk fibers as an alternative to gold or metallic threads in songket can be commercialized, although it is new to the Malaysian craft industry. This innovation is expected to support the sustainability of the environment, as well as the economy, because the product is eco-friendly and it can generate a new

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source of income to farmers, songket weavers, and craft product producers. Indirectly, it also supports the government's economic transformation program as well as preserves Malaysia's unique heritage of songket.

Keywords Corn husk fiber • Songket weaving • Cottage industry

41.1 Introduction

Malaysian *songket* can be considered one of the most popular textiles in Malaysia, if not the world, today. *Songket* is a magnificent traditional Malay fabric beautifully woven in silk or cotton yarn, using gold or colored metallic threads to form traditional or contemporary *songket* motifs. The locals nowadays use *songket* for their ceremonial and fashion apparel, thus keeping the *songket* industry alive. The *songket* industry has the potential to be more competitive when it is developed along the lines of the fashion world, supported by the role of the government in promoting it in the global market. According to [1], the promotion of *songket* to ensure the long-term relevance, growth, and progress of the Malaysian *songket* industry had been the concern of the late Datin Paduka Seri Endon Mahmood. As we live in a globalized world, to be more competitive and marketable globally, there should be new ideas on improving *songket* through new materials and various products that could be made to weave *songket*. Ref. [2] stated that research and development will ultimately include the search for alternative materials and tools for weaving, which will give better quality with new designs and contemporary motifs. According to [3], various approaches to add value and innovate the Malaysian *songket* are important to broaden its usage in order to attract local and international demand today. She also mentioned in her study that the traditional use of metallic threads in *songket* renders the fabric rather stiff, thus causing it to be rather uncomfortable when worn. Hence, its usage is limited. Therefore, it has been realized that *songket* needs to be explored deeply, including the finding of alternative materials, the development of weaving tools, and the creation of new and contemporary designs. Economically, *songket* is one of the backbone activities of the lower-income group. Ref. [4] mentioned that the art of craft making is not only a heritage that needs to be preserved due to its aesthetic value but also due its socioeconomic contribution to society as a cottage industry. In fact, the establishment of the Malaysian Handicraft Board (LKM) in 1973 is the earliest catalyst for the development of this industry and for the protection of the interests of those in the trade who are mostly villagers (Fig. 41.1).

41.2 Issues and Challenges of the Malaysian Songket Industry

Nowadays, *songket* is not only used for fashion, but its usage can be applied in many different ways, such as for decorations and for interior design. It was reported that a few *songket* traders or wholesalers have gone to Pakistan or India to commission the

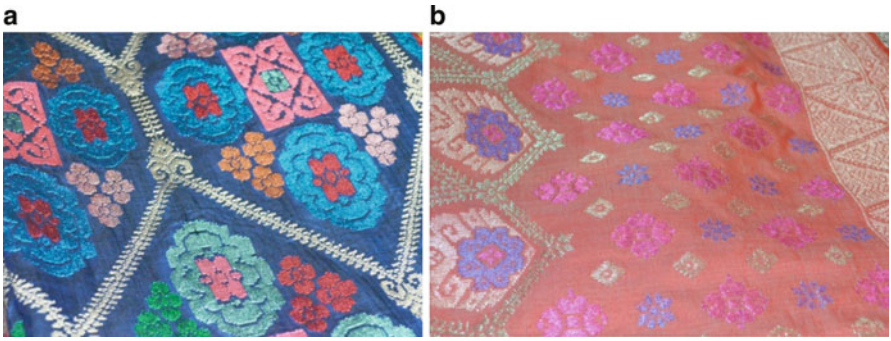

Fig. 41.1 (**a**) *Songket* design (Source: Wan Manang Collections, Terengganu, Malaysia). (**b**) *Songket* design (Source: Wan Manang Collections, Terengganu, Malaysia)

weaving of mass-produced *songket* using Malaysian *songket* designs but to be sold at a much cheaper price than those *songkets* made in Malaysia. To date, the motifs and designs have been improved, and most people cannot differentiate them from the locally woven *songket*. It is believed that the Malaysian traders are the ones that provide the *songket* motifs to these foreign manufacturers. There is no doubt, therefore, that research and development programs for the craft industry are important in producing products that are globally competitive. To date, the Director General of the Malaysian Handicraft Development Corporation gives focus on the four main elements, which are product development, research on new resources and technology, standard development, and the utilization of ICT in product development. It is also reported in Chapter 10 of Industrial Master Plan 2006–2020 [5] that the textile and apparel industry is expected to remain important as Malaysian export products with a growth projection of 5.8% from RM13.4 billion in 2010 to RM24 billion in 2020. Batik and *songket* are among the products listed under higher value-added fabrics and apparel that should be promoted to attract investments. Among the strategies highlighted are to encourage new designs and products of high value-added batik and *songket* for the export market and to intensify the promotion of batik and *songket* locally and internationally.

Therefore, the researcher is trying to introduce a new material, made out of corn husk fibers, to replace imported gold and metallic threads, so that in the future, *songket* would be a cloth that everyone can afford to buy.

41.3 Innovation of a New Material for Supplementary Weft Songket Weaving

Corn is a commonly grown crop in Malaysia, and it is sold as is or processed into various types of food stuff and also as feed for animals. To date, corn has become one of the most popular commercial plants in the country, especially in the production of sweet corn and baby corn. As reported by [6], areas of corn plantations in

Malaysia have increased from year to year, with 5,455 ha in 2004 to 7,176 ha in 2009. Among the major states that produce corn are Johore, Kedah, and Kelantan. Due to the intensive growth of corn plantations, this has led to the abundant disposal of plant leftovers, without much effort in recycling or renewing the waste into useful materials. The only thing that people reuse is the corn stem, which is used as a supplement to be given to farm animals. Much of the corn husks are thrown away or burnt, which will eventually lead to pollution.

However, not many people know that the corn husk, being the strongest part of a corn plant, provides fibers of good quality. Ref. [7] concluded that corn husk fiber has good pliability, has moderate strength, has durability, has longevity, and can retain high moisture. A group of researchers from the University of Nebraska found out that they could only extract shot fibers, which are not useful for textile yarn. The process is still ongoing because it is efficient and inexpensive. According to them, the corn husk fibers could have other uses, such as being used as packing and wrapping materials, fiber composite materials, and industrial fabrics. However, Yiqi Yang, a textile scientist from the University of Nebraska-Lincoln of the United States, had developed corn husk fiber, which can be made into yarn and woven into fabric. He has also discovered that the fiber is natural and more comfortable than many other synthetic fibers and it is easy to dye. The corn husk is useful in making traditional dolls in America, and it can also be made into yarns that can be knitted or woven into fabric [8] (Figs. 41.2, 41.3, and 41.4).

Apart from yielding good-quality fiber, the effort of recycling corn husk waste is also an eco-friendly activity that is consistent with the endeavors to protect our Earth from further pollution. According to the Deputy Minister of the Ministry of Urban Wellbeing, Housing and Local Government, as reported by [9], if recycling was done regularly, the amount of greenhouse gas emissions from landfill sites could be reduced by 38% by 2020. She also added that recycling does not only benefit the environment, but also the economy. The recycling industry in Malaysia was worth RM476 million in 2011 and recently increased to RM600 million. Therefore, the research of turning corn husks into useful materials is viable and in support of recycling, the environment, and the economy.

Fig. 41.2 A corn plantation

Fig. 41.3 Corn for sale

Fig. 41.4 Discarded corn husk waste

41.4 Research Methods Employed

The methods of investigation in this research involved the collection of data and studies on the process of making corn husk into yarns. This research will undergo the fiber extraction process, the selection of quality fibers, the softening process, the spinning and non-spinning process, dyeing, testing the rigidity of the fiber and weaving using a conventional loom and traditional Malay loom. The threads produced will be woven using the same method to weave the *songket*. A few studies on weaving techniques were carried out, such as weaving on cardboard, weaving using a table loom and weaving using the traditional Malay loom (*kek*). Basically, three distinct stages are necessary to execute the research. The research methodology is shown in Fig. 41.5 (Table 41.1).

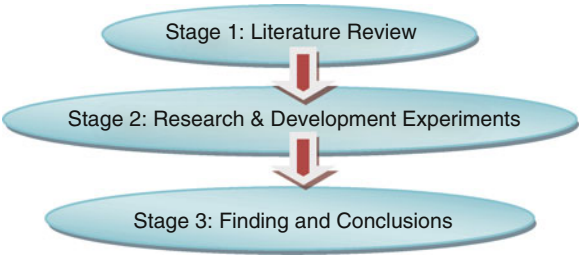

Fig. 41.5 Flowchart illustrating the stages and research method employed by the researcher to execute the research

Table 41.1 The results of the research experiments using corn husk

Type of experiment	Results
Extraction process and fiber selection	The extraction process is used to collect the fibers. Then, a selection process to get the fibers from the corn husk is done by means of a needle. Finally, those fibers are dried out
Softening process	The purpose of the experiment is to identify the effective substance to soften corn fibers and the result of this process using glycerin liquid
Fiber testing and dyeing process	In the testing procedure, these fibers are tested to see the level of their strength by using the single yarn strength and elongation tester in the lab of the Faculty of Applied Sciences. The average of this fiber is 86 g, 13.78 mm and 34.4 %
	After further evaluation upon the result of the experiment, the fiber that is not spun is strong and can be elongated when they are being extended. Dying process using the Remazol dye
Weaving at Kg. Gong Pak Maseh, Kuala Terengganu	It is proven that the corn husk fiber yarn can replace the golden thread that is used in the weaving process

41.5 Application Method and Important Findings

The process of spinning the fiber can only be done after the fiber is soaked into a mixture of glycerin and plain water. This is because to twist the fiber, it has to be flexible and soft. If not, it will brittle and break off. As spinning the fiber makes it a bit hard and stiff, therefore it is better to use them without the spinning process. The result of the *songket* weaving looks good and neat. Both table and traditional looms can definitely be used to weave the corn husk fiber. It would be better if the yarn can be made slightly softer and spun into fine twisted yarns. If it is in thicker twisted yarns, it could also be possible to weave them into other products, such as crafts or for weaving into furniture. Therefore, there is a need to do more research on corn husk fibers for future use in local industries.

Finally, the dyed corn husk fibers underwent the weaving process. The weaving was done using a table loom with polyester warps and a traditional Malay loom

Fig. 41.6 Weaving process

(kek) with cotton warps. The corn husk fiber yarn was woven neatly into sheds of opened warps, as it formed into patterns according to a traditional *songket* design. The woven fabric made using the table loom or the traditional loom can easily be controlled, as the fibers are well selected. Although the fibers are not very long, they can still be woven in two to three ply at a time (Fig. 41.6).

41.6 Conclusion

The cottage industry involving *songket* weaving seems to be experiencing stagnating demand, even though it is a Malaysian heritage that we should be proud of. This innovation, using corn husk fibers to weave *songket*, is hoped to give new breath to this industry to regain demand and appreciation toward Malaysian heritage in modern life. As it is one of the income streams for lower-income groups, therefore, this innovation should be given attention as it does not only serve to transform the economy of this group but it can play a big role in preserving Malaysian heritage. As the production cost is low, it has the potential to be commercialized at a reasonable price either as the *songket* fabric itself or in the form of *songket* craft products such as sling bags, shoes, table cloths, clutches, and many more, which are suitable as gifts. From another point of view, this research is seen to support the government's policy of economic transformation, as well as the "GO GREEN" campaign (Figs. 41.7 and 41.8).

Fig. 41.7 Bag form corn husk *songket*

Fig. 41.8 *Songket* shoes

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Chapter 42
Luminescence Glaze as Third Decoration on Ceramic Surface

Siti Noor Azila Noordin, Mohamad Rizal Salleh, Rusmadiah Anwar, and Oskar Hasdinor Hassan

Abstract This paper described the exploration of collaboration involving ceramic artistic work and advanced material. The study challenged some of the commonly accepted oppositions that have been a mainstay of conventional opposition between artwork and advanced material. Artistic works are usually held to be spontaneous, elegant, full of aesthetic value and unique in some way, whereas advanced materials are usually held to be extremely sensitive in terms of synthesis and fabrication, structure and accuracy. The challenges in the postmodern view as the distinction between ceramic artistic works and advanced material could be vague in certain aspects. The exploration followed a ceramic discipline in the artwork making process, public sculpture besides the nature of material. The ordinary forms of artwork were re-worked and re-imagined through the integration of ceramic advanced material, luminescence and the distortion of artwork approach. The literature on authenticity of labu sayong and the literature on luminescence substance were analysed deeply. The method of the innovative research processes towards the development of both ceramic artwork itself as well as the academic reflection upon it. The challenge is to balance science and art, with both attempts offering unique insight into perception and cognition, often to mutual benefit.

Keywords Sayong fired clay • Ceramic • Luminescence substance • Low-temperature glaze

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42.1 Introduction

Exploratory approach; work apprehensive with material can often involve an experimental, design-by-practice approach, where the artist explores the nuance and idiosyncrasies of the material in order to approach a body of work that challenges what we know to be true. The work explores the nature or characteristic of the material itself. This can include very beautiful formations of the material and sometimes will manifest itself as a reaction or challenge to the material's qualities and expectations of it. The design-through-practice approach involves a process and a decorative aspect [1]. In ceramic, the suitability or appropriateness of the material with the design, artwork or product is of utmost importance. As reported in many academic journals related to ceramic advanced material, the mixture of marble dust waste and stoneware clay is extremely effective in enhancing the strength of the ceramic body in sanitary ware manufacturing [2]. Not only in product manufacturing, ceramic advanced material also played an important role in medical instruments where hydroxyapatite has become a significant thing especially in clinical orthopaedics for damaged skull [3]. Safety awareness is also considered in tiles by incorporating ceramic advanced material. The corundum is an agent of hardness for the glazed surface in producing porcelain antislip tile. It also increased the roughness of the glazed surface [4]. The decoration on the ceramic surface exhibits diversity rather than other surface decorations, for example, wood, glass and canvas. Ceramic decoration involves a main material, clay, tool used, glaze and firing. The decoration of a ceramic surface can be divided into several types. The decoration method of the ceramic surface can be influenced by the condition of the ceramic body and its application methods [5]. The different incised effects extremely influence the decoration effect. The quality of the line and definition of the incised line are determined by the tool used and the dryness of the clay. The decoration effect shows the shaving pares off cleanly when leather-hard but is reduced to dust at the bone-dry stage. The statute of *labu sayong* production was adapted in this research. The sintering temperature of *labu sayong* was significant in order to confirm the maturity of the glazed layer [6].

42.2 Methods

The standard conventional method of glaze mixing is mainly held for the synthesis of low-temperature glaze. The low-temperature glaze was synthesized by standard glaze mixing approach using borax frit, potash feldspar ($K_2O.Al_2O_3.6SiO_2$) and kaolin ($Al_2O_3.2SiO_2.2H_2O$) as materials which are indicated for 800 °C in oxidation atmosphere. The raw powders were mixed. An appropriate amount of the starting materials was weighted and mixed. The low-temperature luminescence substance $SrAl_2O_4:Eu^{2+}$, Dy^{3+} [7, 8, 9] is synthesized by ceramic-based material where europium oxide (Eu_2O_3) and dysprosium oxide (Dy_2O_3) act as activator and co-activator of the

substance [8]. The experiment on low-temperature transparent and luminescence substance $SrAl_2O_4$:Eu^{2+}, Dy^{3+} has been done in three application techniques of glaze: on-glaze, under-glaze and in-glaze [1]. For the base of the samples, stoneware clay was used. Afterwards, the low-temperature transparent glaze and luminescence substance are applied as mentioned above. The on-glaze technique shows that the luminescence substance has been placed on the top part of the sample. It can be specified as after the glaze. The under-glaze technique implies that the luminescence substance is laid below the layer of the low-temperature transparent glaze. The application technique in-glaze elucidate that the luminescence substance is mixed with the low-temperature transparent glaze. The samples are completed after indicating to the sintering temperature, 800 °C in oxidation atmosphere.

42.3 Results and Discussion

On-Glaze

The end result of the on-glaze sample showed that the layer of the low-temperature transparent glaze and luminescence substance achieved the maturing point at 800 °C. The combination of both layers is successful and sustained the glowing effect of the luminescence substance. However, the rough texture occurred on the surface as the luminescence substance powder applied is not finely ground as shown in Fig. 42.1. Figure 42.2 shows the result of the sample that is glowing in the dark where the glaze method was applied.

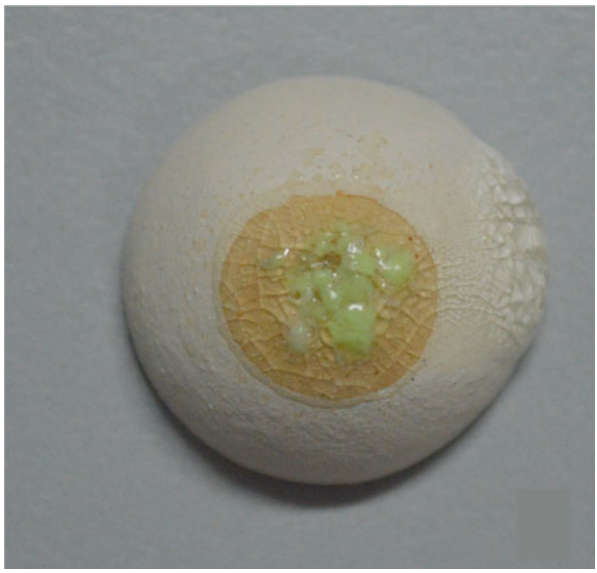

Fig. 42.1 On-glaze sample under the light

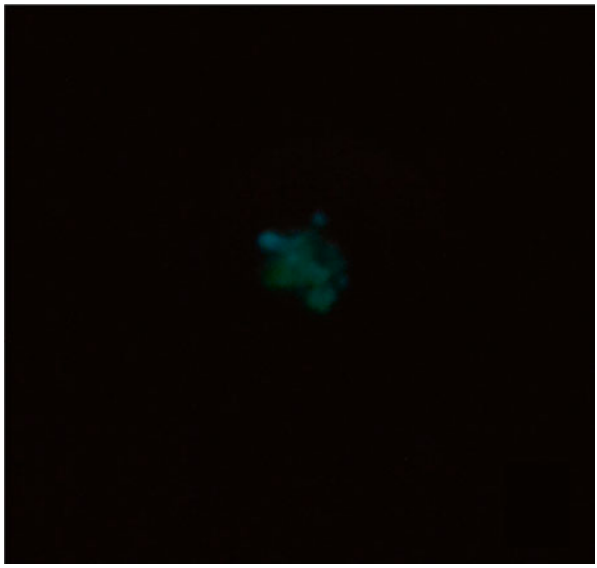

Fig. 42.2 On-glaze sample in the dark room

Fig. 42.3 In-glaze sample under the light

In-Glaze

The result confirms that the low-temperature transparent glaze and luminescence substance layer attained the matured range at 800 °C. The surface of the sample has rough effect since the luminescence substance powder has not been finely ground and is directly mixed into the glaze. The sample done is shown in Fig. 42.3. Moreover, the luminescence substances sustained as shown in Fig. 42.4.

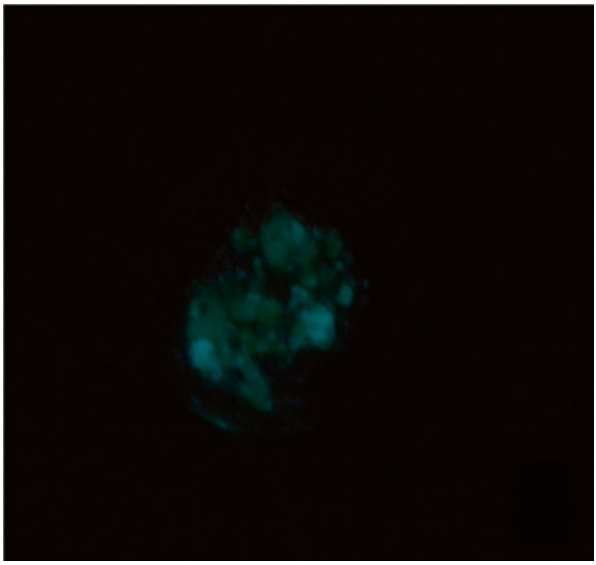

Fig. 42.4 In-glaze sample in the dark room

Fig. 42.5 Under-glaze sample under the light

Under-Glaze

The result showed that the luminescence substance and low-temperature glaze merged well at matured temperature 800°C. The surface of the sample was smooth since the luminescence substance was placed under the glazed layer. The sample under the light was shown in Fig. 42.5. Figure 42.6 shows the effect of glowing in the dark. The luminescence substance was successfully sustained through this technique.

Fig. 42.6 Under-glaze sample in the dark room

42.4 Conclusion

The conventional glaze application method has successfully sustained the luminous grains in the low-temperature transparent glaze. The luminescence glaze can be applied on artwork to enhance the value of the artwork.

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Chapter 43
A Reference to Usability Inspection Methods

Lin Chou Cheng and Muhizam Mustafa

Abstract Engineering usability in software application is never cheap so as the methods to evaluate it. Although there already exist several inspection methods that are touted to be cost-discounting, they are still too hefty to be borne and applied by most indie developers. This paper will discuss the various methods of usability inspections and will provide an overview on the key variables that affect the costing of usability evaluation while discussing the mechanics of the formative inspection methods in depth. Lastly, the paper will highlight the gaps and opportunities for more research into the usability inspection methods.

Keywords Usability evaluation methods • Cost • Task analysis • Cognitive walk-through • Heuristic evaluation

43.1 Introduction

Usability evaluation is a form of user context analysis, which mainly draws from the direct observations of users' task performance when they are interacting with an application. The evaluation can be a costly quantitative experiment or a formative qualitative study which comprises both large and small sample sizes [1, 2]. The methods to evaluate usability are usually a costly construct which would need a considerable amount of resources to administer [3]. The referring costs in usability are the total cost that has been spent on an evaluation cycle, where the definition of costs is based on man-hours (time) and the value of money that has been used during the evaluation activities. According to Nielsen, on average, the costing of usability would siphon an additional 8–13 % of a project's total budget [4]. Although the cost for usability testing does not increase linearly with project size, Nielsen advocated that it would be best to devote additional 10 % of a project's total budget for

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usability testing, as building usability is an iterative process that required recurring spending.

The spending on usability largely goes to a series of evaluation activities, which include planning of evaluation process, creating test tasks, recruiting participants and evaluators, and analyzing the data before preparing the recommendation report to revise the application. The entire evaluation activities would involve great amount of man-hour. For instance, based on a documented experiment by the Technical University of Denmark, the average time spent for evaluating the usability of a website was 39 h [5], with fifty (50) teams of user interface design students as the evaluators. Prior to the experiment, the students underwent 15 h of additional training in user test methodology. This would equate to a total of 6.75 workdays if both the evaluation time and training hours were to be combined and calculated. These man-hours are an upper estimate of the required time for a first run of usability test, and the investment of time can be reduced to two (2) workdays if the evaluation uses discounted approach with experienced evaluators [5]. According to Nielsen [6], a usability testing staff with 5 years of experience would cost as much as USD 84,000 per annum to hire. Although the salaries of usability testing practitioners are lower outside the United States, it would not be much lower than other regional standards of an IT professional's earning. To conduct usability evaluation, one can either choose to self-manage the evaluation or outsource it to a usability consulting firm. However, managing an internal usability team on short-term basis can be very costly, as building a two-room usability lab furnished with one-way mirror and testing equipment can cost as much as USD 100,000 in the early 1994, and the comparable quotes to build usability lab today are in the USD 25,000 range [7]. This is yet to include the cost of hiring usability personnel. On the other hand, the outsourcing solution for usability evaluation is not any cheaper. For instance, one of the leading usability consulting firms – the *Nielsen Norman Group* – has their services priced between USD 10,000 and USD 150,000 per project (*see* Fig. 43.1) [8]. With reference to the services offered by [8], pricing is not the benchmark to determine the effectiveness of a method. Usability evaluation methods (UEMs) are just a collective set of evaluation techniques designed to audit the usability of a user interface. In a tight development framework, the best applicable method to evaluate usability would probably be the quickest and least expensive method that meets the developer's timeline and budget for their product.

	Type of Usability Evaluations	Price (USD)
Formative	Qualitative Usability Tests	$20,000- 40,000
	Iterative Design Usability Tests	$40,000- 70,000
Summative	Competitive Benchmarking	$50,000
	Quantitative Tests	$70,000
	Remote Usability Testing	$10,000- 70,000
	International Tests	$50,000- 150,000

Fig 43.1 Pricing for usability evaluations

From the price list above, the offered five evaluation services can be broadly classified into two distinct categories: the formative and summative methods. These categorical terms of formative and summative originated from assessment design in education where they are used to classify the approach that set to evaluate students' performance [9]. In education, formative methods use interim results to inform one's learning with immediate feedback for self-improvement, whereas summative methods use a standardized test to summarize the performance of a population. The nature of assessment design in education is similar to usability evaluation. The only difference is that the test subject in usability is an application and not students or the users. All the expenditures in usability evaluation are basically a floating operational cost that scales according to the selected type of evaluation methods. By observation, the costing in usability evaluation is largely subjected to the mechanics of the method itself. For instance, based on the sample price list in [10] (*see* Fig. 43.1), the median cost for both the summative and formative UEMs is at the distinct price mark of USD 60,000 and USD 40,000, respectively. All summative testing is more costly compared to the formative one, as it required a large quantity of samples to conclude its finding through discrete statistical distributions [10]. A typical summative usability test would be a one-to-one session that involves two (2) hired individuals: a moderator and a recruited tester (user). Each of the test sessions will have different testers and the same pool of moderators to moderate the test for at least 30–50 sessions. In its formal procedure, the usability test would continue to be run even the findings are about the same after several rounds of initial testing. As such, the spending on such mode of recurring testing would have set a total cost of $30,000 if each of the test sessions is worth $1,000 and is being rendered for thirty (30) times.

The formative UEMs on the other hand have much lower overhead cost as compared to the summative UEMs. This is because the findings of a standard formative evaluation can be concluded among three to five different experienced evaluators. Hence, the formative UEMs are also best known as discounted inspection methods [11]. Although formative UEMs seem to be more cost-efficient as compared to the summative test methods, the challenge lies in hiring usability experts, as there are no standard ways to qualify such expertise and it would not be cheap to engage one [7, 12, 13]. The objective of usability evaluation is to discover what is usable and not usable in an application. The gathered insights aimed to aid the developers to improve their design with better informed decisions, which would benefit their end users. However, usability evaluation is still costly, be it summative or formative.

43.2 Taxonomy of Usability Evaluation Methods

Besides the formative and summative approaches, methods of usability evaluation can be classified into the following streams of inspection and the test approach as shown in Fig. 43.2 [14]. UEMs have long been used to examine the usability of various types of user interface which range from electronic products to application software that are still under development or are about to be released [15–17]. Being part

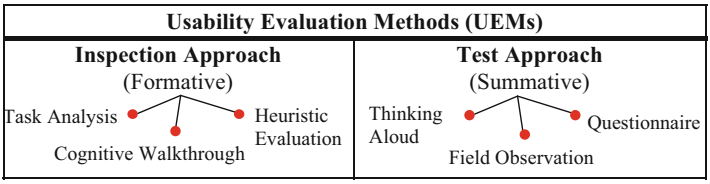

Fig. 43.2 Taxonomy of usability evaluation methods

of the formative techniques, the usability inspection approach is actually similar to the process of quality control (QC), but instead of inspecting a product's defects, usability inspection is set to identify any potential user interface problems that would hinder its users' task performance.

The inspection approach can be divided into techniques like *heuristic evaluation* (HE), *cognitive walk-throughs* (CW), and *task analysis* (TA). All these techniques can be combined or applied separately to inspect the usability of an application. In practice, the techniques of usability inspection are usually being carried out by two to three evaluators who have the expertise in usability. As such, a typical inspection process would not involve real users, as often the professional judgment by the evaluators is regarded to be sufficient.

On the other hand, the test approach is a set of summative evaluation techniques which depend on the real users to detect usability problems for an interface. The basis of the test approach is that real users' feedback is more contextualized and specific, as compared to inspection approach that is based on the general inputs of a selected few. However, the test approach would require high number of real users for ensuring the reliability of the findings, as not all the collated users' opinions or complaints about an interface are reliable. Most UEMs were created back in the early 1990s, which aimed to improve the usable qualities of desktop computing systems at the time. Nevertheless, they are still being used by today's usability professionals. For instance, based on the biannual survey led by the Usability Professionals' Association (UPA) in 2009, a classic inspection technique such as heuristic evaluations is still a favorable technique among many usability practitioners [18]. In usability evaluation, costing is still a prevalent issue, and this could explain why most summative testing methods have constantly lower popularity [18]. By far, formative inspection techniques are the preferred option when there is constraint in costing. Thus, in the following sections, this paper will focus on discussing usability inspection techniques (Table 43.1).

43.3 Usability Inspection Techniques

The inspection approach was first conceived from the informal auditing procedure in software development for debugging a program's source code during the mid-1980s [19, 20]. The practice was then brought over into the development of

Table 43.1 Change in usability evaluation techniques used 2007–2009

Technique	2007 (%)	2009 (%)
Heuristic evaluation (expert review)	77	74
Task analysis	60	58
Usability testing (in a lab)	54	54
Usability testing (remote, moderated)	42	42
Usability testing (remote, un-moderated)	–	18
Creating prototypes (wireframes or low fidelity)	73	69
Contextual inquiry/ethnography	46	42
Creating prototypes (high fidelity)	42	40
Benchmarking or competitive studies	44	40
Satisfaction surveys	35	34
Eye tracking	13	13

graphical user interface (GUI) and subsequently became an alternate solution for usability testing, as real users are often expensive and difficult to recruit in sufficient number for testing all aspects of an evolving design [21]. For instance, a typical usability inspection process would only require three to five (3–5) evaluators, whereas the procedure of usability testing would require at least 30 of real users and a number of moderators in each of the test sessions. Prior to 1990, most usability inspections relied on the general skill and experience of an evaluator without any formalized procedures or guided inspection criteria [22]. Such mode of inspection is usually questionable and plagued with validity issues, as every time a new evaluator who evaluated the same interface would deliver a different scope of findings from the previous one. Over the time, discussions on formalizing usability inspection approach were called to attention, and both the academics and industrial researchers have discovered that the traditional scientific inquisition methods can actually be fruitfully employed to inspect the usability of an interactive system with much better validity [23]. Hence, from 1990 to 1993, there was an explosion of interest in developing new evaluation methods which are built on the existing ones [24]. For instance, UEMs like heuristic evaluation (HE) were an extension of the previously informal inspection technique that is armed with a standardized usability heuristics and checklist. In the following subsection, this paper will look into the inspection techniques of task analysis, cognitive walk-through, and heuristic evaluation, all of which have stood the test of time relatively well.

Task Analysis

Task analysis (TA) is a generic umbrella term of techniques used to investigate users' cognitive processes and physical actions when they are acting on a task [25]. TA is also known as action analysis, where the very definition of task is seen as a

sequence of laborious actions with no internal control structure [14]. The focus of TA as usability inspection technique is to identify and analyze users' mental and physical efforts in details, when they are interacting with a user interface. TA was originally developed to improve occupational task performance of the labor force [26], and it was only later being adapted into the field of human-computer interaction when the industrial landscape has changed from analogue to digital technology. The use of TA is to comprehend users' task requirements, by breaking down an observed task into its lowest level of acts, and then re-cluster them into plausible scenarios where the users would perform in an actual course. For instance, considering the task of buying an e-book via online store [27], the digital task was observed and deconstructed into five different sequential acts as follows:

1. Locate the book.
2. Add a book to shopping cart.
3. Enter payment details.
4. Complete billing and mailing address.
5. Confirm order.

Based on the preliminary task flow, the online book buying action can be organized into two plausible scenarios based on the predefined users' experience profile (*see* Fig. 43.3). By drawing from these two scenarios, an inspection process would then follow suite to assess the usability of the e-commerce website, whether the website's interface can effectively and efficiently support the course of book buying actions for both the new and experienced users.

The process of TA can be extended by using questionnaires or open-ended user interviews to gather more detailed information about how people would actually perform a specific type of task [28]. The questionnaires can be administered as a face-to-face interview or an online survey for identifying users' task requirements [29]. The gathered requirements enable the application designers to have a deeper insight into users' task needs before actual development [25]. Overall, TA is a user-centered inspection technique, where only one experienced practitioner is needed to do the inspection. However, such user-centered inspection technique has its disadvantages, as it is too time consuming and skill dependent. In addition, TA has limited application, as it cannot model after complex users' task [25]. Hence, this explained why the usage of task analysis has fifty-eight percent (58 %) declining popularity in the 2009 UPA's survey; a time-consuming method is not favorable in a tight developing environment.

New Users (Customers) Do: [1,2,3,4,5]	Experience Users (Regular Customers) Do: [1,2,5]
1. Locate the book; 2. Add a book to shopping cart; 3. Enter payment details; 4. Complete billing and mailing address; 5. Confirm order.	1. Locate the book; 2. Add a book to shopping cart; 5. Confirm order.

Fig. 43.3 Users' task analysis for online book buying

Cognitive Walk-Through

Cognitive walk-through (CW) is another usability inspection technique that used to predict usability problems without engaging any real users. The idea of CW originated from exploratory learning principles, where the method is used to study users' mental processes, for how well they learn to solve a given directive by exploring the limited yet salient options plotted by the designer [10, 30]. The referred directive is simulated user instructions set in the format of human-computer dialogue, which was later displayed for its evaluator to solve within the available system's functionalities [11]. CW is commonly used to assess whether an application's interface has enough instructional cues to support users' mental state when they are attempting a task, whereas TA focuses on whether an application has the right interfaces to accommodate the required interaction to complete a task. For instance, the following is a snippet of CW from [25], which is based on another similar online book buying scenario (Fig. 43.4).

The process of CW usually involves a team of evaluators, comprises of application designer and developers who would walk through the features set of their product, and notes any usability issue that they may encounter, through a series of reflective questions. The process of CW requires a fully functioning prototype for the evaluators to effectively explore their own design from the end users' perspective. The use of CW was originally developed for inspecting desktop systems, but it can be adapted to evaluate web-based applications and other tangible handheld devices [25]. The working mechanism for a successful CW is to document the testers' account in each attempted task sequence, depicting what works and what does not work. All documented usability issues would then be further analyzed before classifying the severity of the problem. The strength of CW lies in its micro level of inspection, by examining every assumptive step that the users might take when they are interacting with the prototype. Such deep-level mode of inspection approach is found to be invaluable when evaluating systems that are safety critical [25]. CW is considered to be cost-effective as the development team can role-play themselves to identify usability problems without hiring the real users. However, the

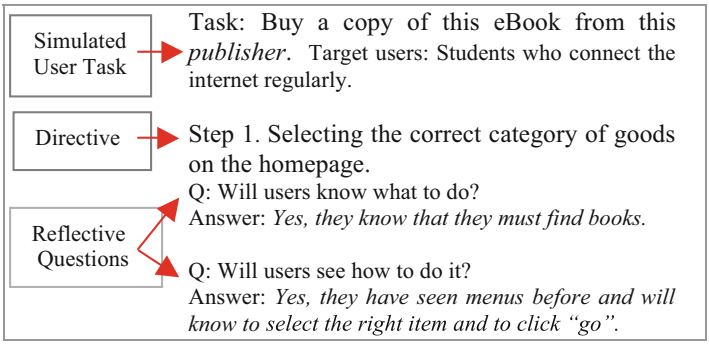

Fig. 43.4 Cognitive walk-through test task

noninvolvement of the real users or any other independent evaluators would create the danger of inherent bias during the walk-through [14]. For instance, the application's designers who acted as the evaluators would tend to be more defensive when potential usability problems with their design are being highlighted to them; this would often evoke a long argument to justify their designs at the expenses of any necessary fixes [31]. Like TA, CW is also found to be too time consuming and tedious as the method needs to query and answer at every level of actions. The effectiveness of CW is tied to its deep-level mode of slow data gathering process; hence, the walk-through would need to be executed in a slower pace.

Heuristic Evaluation

Heuristic evaluation (HE) is a popular and widely used inspection technique pioneered by Jakob Nielsen and Rolf Molich during the early 1990s [32]. The inspection process of HE involves having usability specialists to evaluate a user interface with a set of usability principles known as heuristics [14, 21]. HE is also known as *expert review*, as the evaluators who review or inspect the user interface are usually the product domain experts who know about usability requirement [7]. By far, HE is the only inspection technique that uses usability experts to audit an interface's navigation structure, dialogue box, menu, etc., through a set of empirical or validated heuristics. The original mechanic of HE is to have a single expert evaluator performing the inspection alone. However, the method was later revised by Nielsen [33] to include a few more evaluators, to widen the scope of the inspection. The rationale behind the refinement came from other Nielsen's experiments when inspecting a voice response system. In the experiment, Nielsen had asked nineteen (19) expert evaluators to identify sixteen (16) usability problems, which were all purportedly sowed into the voice response system before the actual experiment. Interestingly, all the returned discoveries by the nineteen (19) expert evaluators were more varied and more diverse than the predicted findings. Then, there came the question about how many expert evaluators are needed for hosting a reliable HE. The common connotation back then was that the more expert evaluators are on the job, the higher the usability problem discovery rate would be. But to include more evaluators, the purpose of HE for being a cost-effective inspection technique would be defeated, as it would not be any different from summative UEMs. In a real development, all usability studies should use as few evaluators as possible when resources are tight.

As a result, both Nielsen and Landauer come up with a predictive model and set the optimum cost-benefit ratio of HE, which is not to have more than five evaluators per testing [34]. This is because the findings after the fifth evaluator would be repeatedly the same, as 85 % of the usability problems would have been identified by the previous five evaluators. To explain their substantial discovery, both Nielsen and Landauer used the following nomograph to address the cost-effectiveness by having only five evaluators (Fig. 43.5).

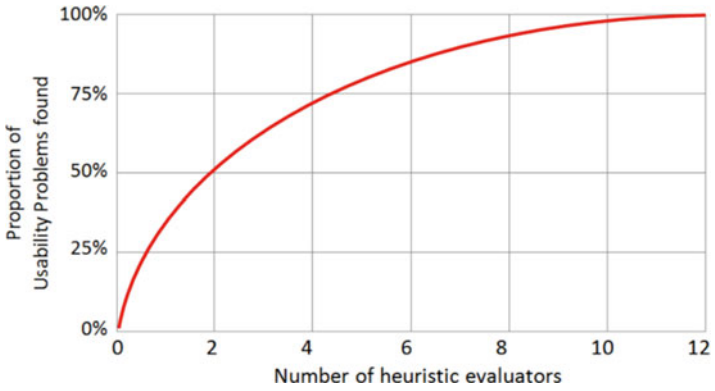

Fig. 43.5 Proportion of usability problems with numbers of evaluators

For instance, the nomograph showed there will be zero usability problems if there is zero evaluator in action. As soon as there are two evaluators entering the evaluation, the usability problems' discovery rate would jump astoundingly to fifty percent (50 %). Subsequently, there will be lesser and lesser new usability problems to be uncovered after the fifth evaluator as most of the obvious problems would have been pointed out by the first five evaluators. This influential finding in [34] by Nielsen and Landauer has also indirectly asserted one of the earlier hypothetical claims by Virzi in [35], where the act of "observing additional participants will reveal fewer and fewer new usability problems." The findings by these researchers were also repeatedly confirmed in the published findings by Lewis [36] who stated that the law of diminishing returns applies to HE, as discovery rate of new usability problems would begin to stay stagnant and incrementally diminish after the eighth evaluator. In other words, it is not economical to repeat the inspection process for the same interface for more than eight times, as the subsequent findings would deem to be redundant. In [36], Lewis also pointed out that it would be highly unrealistic for most usability evaluation studies to uncover ninety-nine percent (99 %) of usability problems within an application, as the evaluation would require the sample inputs from four hundred and eighteen (418) expert evaluators. The cornerstone to a successful HE is the selection of usability heuristics that are contextually relevant.

Usability heuristics are general rules of thumb that set to guide the design of an interface. In their first founding method of HE, both Nielsen and Molich proposed a smaller set of heuristics that are made up of nine empirical usability principles [32]. These were empirically tested principles derived from the analysis of 249 usability problems [31]. Later, Nielsen revised the heuristics to the ten with better explanatory power [37]. Besides the 10 Usability Heuristics by Nielsen, there are other usability guidelines such as Gerhardt-Powals Heuristics [38] which were based on cognitive design principles. By far, the heuristics by Gerhardt-Powals is the only set of heuristics that has been validated by human factors research [39].

Nielsen's Ten Heuristics	Gerhardt-Powals Heuristics
1. Visibility of system status 2. Match between system and the real world 3. User control and freedom 4. Consistency and standards 5. Error prevention 6. Recognition rather than recall 7. Flexibility and efficiency of use 8. Aesthetic and minimalist design 9. Help users recognize, diagnose, and recover from errors 10. Help and documentation	1. Automate unwanted workload 2. Reduce uncertainty 3. Fuse data 4. Present new information with meaningful aids to interpretation 5. Use names that are conceptually related to function 6. Limit data-driven tasks 7. Include in the displays only that information needed by the user at a given time. 8. Provide multiple coding of data when appropriate. 9. Practice judicious redundancy.

Fig. 43.6 Comparison of usability heuristics

However, Nielsen's 10 Usability Heuristics are the most widely adopted guidelines compared to others, as it is more concise and easily understood (Fig. 43.6).

Most usability heuristics were developed way before the emergence of apps culture. Having said so, Nielsen's heuristics is still relevant for evaluating mobile technologies [40]. For instance, Wright et al. have applied the heuristics in [37] to evaluate a mobile fax application known as MoFax [41]. MoFax was an application created to support industry representatives who often send faxes of plans to conventional fax machines while out in the construction field. Initially, Wright et al. have planned to perform field testing with real users. Prior to the summative testing, Wright et al. have discovered that the MoFax interface was so unusable that they decided to conduct an HE instead of having a costly user testing when the problems are obvious. With three (3) expert evaluators, fifty-six (56) usability problems were then identified for MoFax, and the developers mitigated all the problems by redesigning the application. The advantages of HE are in its effectiveness to identify all major and minor usability problems of an application in any given stage [14]. With the inputs from three to five experienced evaluators, all identified problems could be prioritized and analyzed along with proposed solutions to improve usability. The benefit to having experienced evaluators for usability inspection is that time can be saved during the process of problem analysis as the evaluators can act as the analysts themselves to provide sample solutions. Testing with end users would require the presence of moderators and external analysts to analyze the identified usability problems before generating any solutions. HE can be performed by less-experienced people as they will be guided with the heuristics [14]. For instance, in a comparative study of web usability for the blinds, Mankoff et al. [42] have discovered that the developers who are not the usability expert were capable to find 50 % of known usability problems with HE. Mankoff et al. have concluded that HE, as an inspection method, is more cost-effective in their experiment if they were to perform user testing with the blind users.

However, HE is not perfect. Several studies have reported that HE is not always reliable in identifying usability problems, even though the evaluators have been guided with a set of heuristics [15, 43–47]. The issues come from inconsistent reporting among different evaluators who evaluated the same interface, as there are no standard ways of documenting the findings with a common lingo [48]. Thus, there are two notable revised HE methods, namely, *HE-Plus* and *HE++* which are developed by Chattractichart and Lindgaard which aimed to address the reliability issues [49–51]. The method of HE-Plus used a catalogue of node-based problem descriptors that was found in [48] and overlapped it with Nielsen's heuristics. However, such approach is quite time consuming and complex, as it requires the evaluators to keep checking with an exhaustive list of catalogue, and there will be situations that the problem description nodes were too rigid to describe a usability problem. To validate the effectiveness of these new methods, a comparative study had been conducted between the methods of HE, HE-Plus, and HE++ [12]. From the study, both HE++ and HE-Plus have demonstrated that they have better reliability and effectiveness compare to HE. However, there is no way to ascertain the findings in [12], as the profile of the recruited expert evaluators was being misguided as part of the sample population were students.

43.4 Overview

Usability evaluation is essential for creating a usable application that is acceptably easy and sometimes safe to use within a specific environment. However, testing with real users is not cost-effective. This paper had revisited the inspection techniques of TA, CW, and HE. All these methods usually need three to five usability experts to role-play the interaction of real users and provide constructive insights whether a prototype is fit to be used. By far, HE is one of the most widely adopted inspection methods that is seemingly cost-effective. However, HE has some reliability issue that needs to be addressed. In view of that, this paper has highlighted the gaps and research opportunities for developing a more streamlined usability inspection method. There is a need to further advance the existing usability inspection methods for meeting today's shorter time to market development model.

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Chapter 44
From Subjectivity to Objective Evaluation: A Techno-rationalist Approach of Assessment Design for Art and Design Education

Lin Chou Cheng

Abstract In the field of art and design, it is an accepted norm for the marketplace's art appraisers to use subjective assessment in determining the quality of an artwork. Inherently, such subjective mode of judgmental practice is also somewhat formalized and being brought into the art education. The use of subjective assessment in the context of art is touted to have better validity among the practitioners, as the work of art has a unique emotional context that cannot be assessed in a fixated manner. However, from the perspective of institutional ranking purposes, the use of subjective assessment is posed to have a reliability issue, for it cannot objectively differentiate students' performance from the norms and the goods. In spite of the fact that art is customarily to be appraised subjectively, this paper would like to share that the work of art can be evaluated objectively, through the adoption of criteria-marking scheme that is techno-rational centric.

Keywords Assessment • Assessment of learning • Assessment for learning • Criterion reference • Norm-referenced assessment • Assessment for art and design • Techno-rationalist

44.1 Introduction

The work of creative art is elusive by nature as it is not easily defined [1]. In his article [2], Dallow had reflected that art is like philosophy, and it is difficult to be contained or conceptually explained. Such elusiveness is all because of subjectivity, where the judgment of a creative work lies in the eye of beholder. This sort of tantalized perception had its impact toward the assessment of creative art, as in the context of education, there is no room for subjectivity especially when an assessment is related to public accountability. All assessments for creative art should be

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just like any other exams where they can be objectively valid and reliably discreet toward the abilities of a given student population. However, achieving objectivity during an event of assessment in visual art remains to be difficult and challenging, as there is no standard model answer to it [3, 4]. The challenge in the assessment of creative works lies in how to identify and adopt agreeable criteria as the standard measure among different assessors. It is a common struggle among all art educators and assessors to identify such exemplary criteria that can reliably describe the students' attainment at a particular period of time [5].

However, the actual challenge in the assessment design for art and design education is actually not so much about the identification of exemplary criteria. Rather, it is the procedure of a particular mode of assessment that posed the problems. In practice, most visual art modules would have their learning outcomes being examined through a series of deliverable product. These delivered student products can be a mix of different tangible and intangible forms of art, produced and self-curated over a given period of time. These deliverables are commonly referred to as portfolio. A portfolio of art is usually open ended; it is a collection of evidence that demonstrates one's creative performance. There is no definite model answer to measure one's portfolio, as the assessment is usually subjected to the interpretation and evaluation of its team of assessors through the manner of studio-based dialogue [6]. Such discourse mode of assessment procedure tends to lack reliability, as the judgments can vary from different groups of assessors who have different perceptual beliefs, identity, and expectation.

44.2 Research Objective

This study begins with the objective to establish a common evaluation framework that can help to guide a team of assessors to minimize the bias when assessing art and design modules. From the perspective of an educator and a creative practitioner, a reliable assessment is possible if there is a calibration procedure in place for the assessors who are part of the teaching team. By and large, in the teaching of creative arts, the assessors are teachers who are or have been practitioners themselves [7]. As such, this group of assessors would act with their own professional judgment during an assessment [8]. In most situations, the assessors would be the authority that is central to this process as they are being empowered to act on behalf of an educational system [9]. Inevitably, an event of hegemony like "harsh" marking would occur, when one of these professional-practitioner teachers used their own yardstick of "industrial" standard to gauge a young learner's work. Regardless of intention, these aberrant assessors simply acted according to the standard of their domain, where excellence is expected. This has invited the question of whether the judgment of an experienced practitioner is valid and fair, as their basis of measurement can be subjectively broad or too narrow at times [1]. Thus, in order to comprehend how an art educator would appraise one's creative work, Cowdroy and Williams had conducted an interesting study which shockingly revealed that most tutors in creative arts tend to rely on their intuitive

understanding of a creative ability, and their evaluation was emotionally based on the manner of "what we teachers like" about the work during the assessment [10]. The findings in [10] were not much of a surprise in the landscape of art and design education, but rather a formal confirmation about the existence of such issues where the current assessment practices are far from being objectively reliable. Nevertheless, in higher education the opinions of professional assessors are still central to assessment practice for art education as their judgment is regarded as amenable [8].

Thus, there is a need to develop a reliable assessment framework that can support the creative art assessors to regulate their own marking decisions objectively within a reasonable pedagogical context. Hence, in the effort to reduce inconsistency between assessors within a teaching team, this paper is to propose the adoption of criteria-marking scheme that is techno-rational centric, as the basis of measurement for assessing any creative art subjects.

44.3 Research Background

The practice of assessment is one of the complex yet important processes that are central to every academic curriculum. The methods and beliefs about assessment are similar to any teaching and learning strategy, where both practices are highly dependent on institutional procedures and their policies [11]. To date, there are two distinct types of academic assessment: "assessment for learning (AfL)" and "assessment of learning." Each of these assessment types has its own methodological belief that would influence students' behaviors in learning. As pointed out by Biggs [12], "assessment determines what and how students learn more than the curriculum does." For instance, the assessment of learning is about public accountability; it is a macro evaluation system that ranks the academic performance of a given student population in a particular period of time against the national standard [13]. The assessment of learning uses norm referencing, where ranking of the students is top priority rather than the individual attainment of students. As such, the outcome of norm referencing can be visually modeled and represented by a bell-shaped curve, shown in Fig. 44.1. The mechanic of norm referencing uses a standardized test to classify a broad range of students into dependable rank order. Based on the belief of this system, high achievers would always be limited to a handful. Norm referencing works in a way that if a group of distinctive students were to be banded together and put through another set of test, the system can further differentiate this group of distinctive students into a whole new rank of "A, B, C, and D."

As such, the outcome of a norm referencing type of assessment should always retain a graph of normal distribution, similar to Fig. 44.1. However, if the results had far too many high achievers, the results can be voided for it cannot differentiate between the norms and the goods. In such circumstances, the assessment might need to be redesigned and readministered. However, this seldom happens as the policy makers can decide whether to skew the graph to the right to maintain the pattern of a normal distribution.

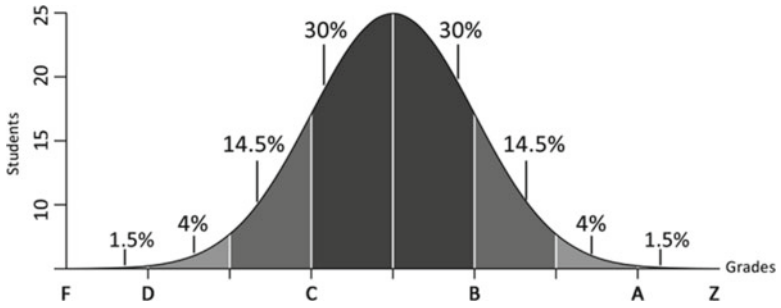

Fig. 44.1 Sample of bell-shaped curve distribution

Unlike the assessment of learning, AfL uses the system of criteria referencing to measure what the learners can do and know, without benchmarking them against their peers [14]. Criteria referencing stresses on the attainment of every individual learner within the predetermined learning outcomes of a curriculum. These learning outcomes are clearly stated criteria for a particular level of practices, and a learner's achievement is to be compared against these standards. As such, there will be a high percentile of learners within a particular cohort to receive either very high or very low grades [15]. Both the methods for assessment of learning and AfL have been used interchangeably, and again, the adoption is subjected to the policy of the respective institutions.

From a holistic viewpoint, criterion referencing has higher degree of validity when assessing art and design modules, as the practices of creative art are all unique performances of individuals. On the other hand, the norm referencing system is better at reliability to gauge a student's performance in the exams; peer benchmarking is much more objective than measuring the creative abilities of an individual, which can be abstract at times. Nevertheless, it is possible to use criterion referencing within the method for assessment of learning. In criterion referencing, students are evaluated individually based on a set of criteria and standards than being graded and compared among their peers. The aim of criterion referencing is to differentiate what students know, understand, and can do, as the result is a formative feedback for teachers and students on their future teaching and learning needs [16]. In this system, students are to compare against descriptions of expected standard across a range of criteria without the need of referencing against the performance of others [17]. However, to maintain reliability among different assessors who use the same exact marking criteria is challenging. The reliability issue in a criteria-based assessment is largely hinged on the involvement of human interpretation of a given criterion. According to Green, a "true" criteria-based marking scheme can be relatively narrow, as highly reliable criteria would not allow other range of interpretations by its user [17]. These micro criterions were meant to guide and restrain the assessors from any bias interpretation. Nevertheless, such criteria-based marking scheme is too time-consuming to prepare and be followed [16].

As discussed, the assessment issue in creative art is duly caused by the accepted norm of either having a loosely crafted criteria-marking scheme or no use of criteria

at all. However, all these can be improved if the assessors were to adopt a rigorous criteria-based marking scheme as their basis of measure. By holding on to this hypothetical view, no work of art is too elusive to be evaluated objectively. Hence, in an effort to validly assess every student's capability with criteria referencing, while achieving a reliable normal distributed outcome that fits the institutional ranking purposes, this research had proposed and implemented the use of criteria-based marking scheme that is techno-rational centric. The proposed assessment practice has been implemented on the subject – *Game Modeling* (GAM). GAM is an introductory technical art subject offered to polytechnic students who studied in the course of game design and development. The subject has been designed and taught in a studio-based approach, with the aim to equip students with technical 3D modeling skills through the use of a 3D graphic application. Through the subject, students will be able to create a series of three-dimensional (3D) digital model for real-time use.

To craft the techno-rational marking scheme for this study, the performance descriptors of the rubric were mainly a detailed extension of the general learning outcomes of the GAM syllabus, which was later being fused with quantitative requirement. In the context of education, techno-rational is about the systematical use of quantitative measure to ensure accountability, and as such, the approach of techno-rational has strong emphasis on validity, objectivity, processes, and procedures [8, 18]. Besides the extrinsic motivation of being a conscientious educator who is obliged to public accountability, the intrinsic motivation of this study and its implementation was largely a personal reflection and a statement of belief in AfL. Prior to the commencement of the subject, GAM was assigned to a team of instructors who were veteran creative practitioners being teamed up for the first time. The issue of reliability was foreseeable among the instructors if the teaching team were to rely on a standard criteria-based marking scheme and the use of a studio-based dialogue. It would take quite a while for the teaching team to calibrate itself. Hence, instead of risking and bracing for unreliable outcome with abnormal distribution of grades, a formal method had to be put in place to direct this group of individual instructors who were going to be the assessors, to be objective during the assessment. From the literature [16, 17], a criteria-based marking scheme can be easily subjected to various interpretations. By recognizing this issue, the techno-rational approach was proposed; all the written assessment criteria for GAM are injected with quantifiable requirements, and any flimsy qualitative statements that might be dubious to interpret are avoided. A study of effectiveness has then been conducted on this proposed assessment practice, and the findings were reported in the following sections.

44.4 Research Method

As aforementioned, this study is intended to find out the reliability of the proposed criteria-marking scheme, which is based on techno-rationalism. The hypothesis of this research is that all biases in the assessment of art can be reduced if all the art assessors were to adopt the same quantifiable marking criteria. The assessment

- Construct basic 3D model by utilizing appropriate Digital Content Creation (DCC) tool;

- Demonstrate the application of polygon modelling techniques to create 3D objects;

- Apply appropriate low-poly modelling techniques to create 3D game object;

Fig. 44.2 General learning outcomes for GAM

would then be able to achieve better inter-rater and intra-rater reliability when there is less involvement of human judgments and dubious interpretations. Quantitative methods were used to conduct the study. The study began with part 1 of the first GAM's assignment: modeling a 3D game level. The assignment is set to measure students' capabilities in crafting 3D objects with a set of prescribed requirements, which is stated in the project brief. The assessment was designed to coach students incrementally to attain three general learning outcomes stated in the GAM's syllabus (Fig. 44.2).

The study involved second year polytechnic students in the Game Design and Development course at a middle-sized polytechnic. The course has good transparency, as the subject's information, such as teaching plan, marking schemes, and teaching materials, was made available in advance for all students to access. Seventy-eight students took the subject (GAM), and this research had sampled 49 students who were randomly selected from three different tutorial groups (P1, P2, and P3). The age of the participants ranged from 17 to 21 years old. The study began by first distributing the proposed criteria-marking scheme to these 41 participants and the researcher. The participants were asked to assess their own work individually based on the given criteria-marking scheme in 30 min. After that their self-assessed result with the given mark sheet was submitted to their tutors. The researcher will evaluate all the participants' works. All the assessments conducted by the researcher were made independently and in reference to the same marking scheme. Toward the end of the process, two sets of test scores were provided by the two parties: the student participants and the researcher.

To analyze the collected data, the research used Microsoft Excel and applied "Pearson correlation coefficient" analyses. As stated, the aim of this research is to determine the inter and intra-reliability of a criteria-marking scheme that centered on techno-rationalism. The study stood on the hypothesis that the higher the correlation (agreement) between the students and researcher during an assessment, the more reliable of the suggested criteria-marking scheme. To interpret the level of correlation coefficient, the research followed the guidelines given by Cohen [19] and Hopkins [20]. There are about seven ranges of correlation coefficient values, as shown in Table 44.1.

Table 44.1 Guideline of correlation coefficient value

Correlation coefficient descriptor	Value (positive)
Trivial	0.0–0.09
Low	0.1–0.29
Medium	0.3–0.49
High	0.5–0.69
Very high	0.7–0.89
Neatly perfect	0.9–0.99
Perfect	1.0

Table 44.2 Assessment correlations between students and researcher for tutorial groups P1, P2, and P3

Assessors	Students	Researcher
Students	1.000	
Researcher	0.651	1.000

44.5 Findings and Discussions

Based on the initial analyses, the result in Table 44.2 had shown that the scoring between the students and the researcher was at 0.651. By consulting the guideline in Table 44.1, the finding was to be interpreted as high. This preliminary study had somewhat positively supported the hypothesis of this research, where a techno-rationalist type of criteria-marking scheme has better inter-rater and intra-rater reliability. According to Sabol [5], assessment that has high correlation among two different groups of assessors, such as the students and the researcher, which in this context was possibly the result of pre-imposition of criteria into the learning and teaching strategies before the assessment. In fact, it is a positive sign that teachers are being serious in developing their students with a specific range of knowledge and skills [4]. Although this study had shown a significant level of reliability with the correlation analyses, there are gaps that need to be closed so as to ensure absolute reliability.

This is because according to the research by Pitts, Coles, and Thomas [21], the average level of reliability between the individual assessors is usually only moderate, but the preliminary result of this research had suggested otherwise. Thus, this researcher has decided to conduct a second correlational analysis, by extending the initial study with additional set of inputs from another independent assessor who is the instructor for tutorial group of P2. The new extended study had paired the instructor of P2 to evaluate the artworks from the tutorial group of P3 with the same exact criteria-marking scheme. With an additional input from this new assessor, the research now has three sets of correlative data to compare and analyze.

In this extended study, the sample size constituted of eleven students from tutorial group of P3, the researcher, and the new assessor himself. The first analysis showed that the correlations between the students and the researcher were at 0.546 and were regarded as high (See Table 44.3). However, the newly obtained value is

Table 44.3 Assessment correlations between students, researcher, and assessor for tutorial group P3

Assessors	Students	Researcher	Assessor
Students	1.000		
Researcher	0.546	1.000	
Assessor	0.451	0.930	1.000

significantly lower than the previous study which was at 0.651 with the sample size of forty-nine. The researcher noted that some students in P3 might be a little bit overconfident about their work and they had rated themselves much higher than they should. Interestingly, the correlations between the new assessor and the students were at medium value of 0.451. This suggested that there were more disagreements between the students and the new assessor within the exact criteria-marking scheme. Based on observation, the new assessor came in as an artist-educator and was different from the researcher who is the archetype of an educator-artist. Hence, the new assessor would be more critical in his judgment during the evaluation. Nevertheless, the correlations score between both of the researcher and assessor was neatly pitched at 0.930.

This significant correlations finding between the researcher and assessor has implied that both markers who have the background of professional practice tend to be highly reliable in their judgment when a techno-rational centric criteria-marking scheme is being employed.

44.6 Conclusions

In conclusion, the assessment system of criteria referencing can be highly reliable and can function like the norm-referenced assessment in differentiating and ranking students for public accountability. A distribution of bell-shaped curve would naturally occur without any skewness if a system of assessment is highly valid and reliable. For instance, the final subject statistic for GAM was able to closely achieve normal distribution while objectively assessing the attainment of every individual student without peer benchmarking. Furthermore, the implemented approach was regarded as more holistic and liberal, as it allows more room for deserving students to receive the commendable grade (Fig. 44.3).

With such an assessment system, it would cultivate a different competitive culture, by comparing to oneself than with others. Nevertheless, all this can only happen when a techno-rational centric criteria-marking scheme is in place. The work of creative art can indeed be objectively evaluated. Through this study, the implemented research method and the use of correlational analyses can actually be adapted into other techno-rational approach for the purpose of testing and calibrating any newly crafted marking rubrics.

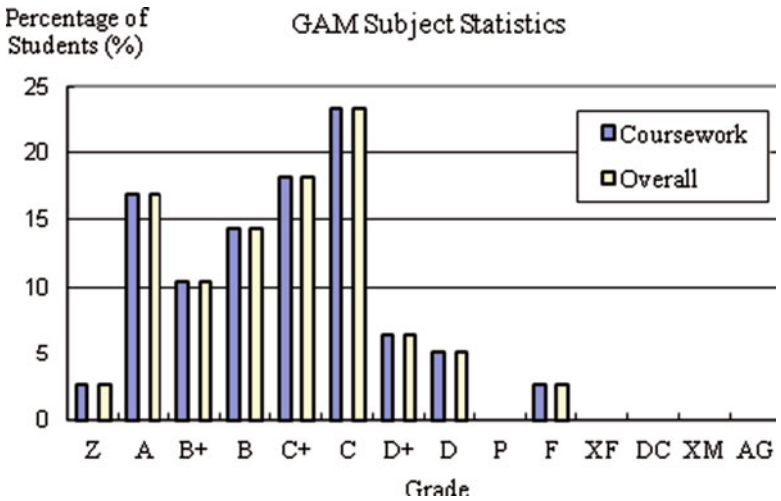

Fig. 44.3 Final subject statistic for GAM

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Chapter 45
Correlation Between Behaviour and Design in Influencing Ablution Tub

Nor Haliza Johari, Muhamad Fairus Kamaruzaman, Oskar Hasdinor Hassan, and Rusmadiah Anwar

Abstract Ablution is also known as a wudhu and the term comes from the Arabic nouns. Ablution is categorized as washing procedure and also part of compulsory activities to cleanse, in particular the body, before performing the prayers. According to the observation on the impact of human behaviour towards the ablution tub design, too much water has been consumed in performing the ablution ritual. Moreover, the existing designs of ablution tub indicate that the design will influence the human behaviour in performing the ablution ritual. Based on the research that has been done, it indicates that the human behaviour and the design of ablution tub influence each other. As a conclusion, a control system is needed to control the behaviour in performing the ablution ritual and to enhance opportunities of fundamental structure of ablution tub design, which pertains to the full participation of persons in social life and national development.

Keywords Ablution ritual • Ablution tub • Human behaviour • Design

45.1 Introduction

Ablution is a washing procedure to cleanse the body from small impurities and is also part of the compulsory activities and requirement before performing the prayers. Explicitly, a *sahih hadith* mentioned that the Prophet Muhammad will not

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accept the prayer of a person until he/she has done the ablution ritual [1, 2]. In addition, ablution also has a specific procedure, where it involves the washing of a particular body part and it must be performed in sequence. Consequently, the procedures start by washing the face, then both hands, forehead and finally both feet [3–5]. The ablution ritual follows a sequence of washing each body part twice or three times [4].

As the ablution ritual involves water usage, it leads to the introduction of the ablution station (ablution tub) where the ritual is performed. Based on the literature, there are many ideas on the variation of design for ablution stations as have been built at the mosque [6, 7]. Therefore, the design of the ablution tub should consider the human behaviour in performing the ablution ritual. This study examines how human behaviour may influence the way the Muslim society performs the ablution ritual and the impact of ablution tub towards human behaviour.

Ablution is a category of washing procedure to cleanse itself from small impurities and it also as part of compulsory activities and requirement before performing the prayers. Explicitly, there is a *sahih hadith* been mentioned that the Prophet Muhammad will not accept the prayer of person until he has done perform the ablution ritual [1, 2]. In addition, ablution also has a specific procedure, where it involves the washing of the particular body and it must be performed in sequence. Consequently, the procedures start by washing of the face, both hands, forehead and both feets [3–5]. The sequence it also follows by washing repetition with twice or three times for each particular while perform the ablution ritual [4].

As the ablution ritual involve with the water usage, it leads introduction of the place of ablution station (ablution tub) to perform the ablution ritual. Base on the literature, ablution station has many idea of variation design as been built at the mosque [6, 7]. Therefore, the variation design of ablution tub encompass the human behaviour while perform the ablution ritual. This study examines how the human behaviour may influence the way Muslim society perform the ablution ritual and the impact of ablution tub towards human behaviour.

45.2 Problem Statement

Subsequently, through observation, the impact of human behaviour towards the ablution tub design was discovered. When the Muslims were performing the ablution ritual, it indicated too much water consumption. As stated by Besari, in performing the ablution ritual, it typically required about 6–9 l of water [8]. From that average, about 1/2–2 l of water is enough to complete the whole ritual [9, 10]. However, behaviour is different from one to another, because some people use water efficiently and some of them waste water [11]. Therefore, human behaviour is considered as the major fundamental factor in designing the product, because human

Fig. 45.1 The existing design of ablution station

behaviour is an individual interpretation and observation on the product to create their own understanding and their thinking on how to use or manoeuvre it [12, 13]. In addition, the effect of the current design of ablution tub towards the human behaviour was observed. Most of the existing designs of ablution tub in the mosque were designed without accommodating the principle of ablution. Moreover, there are many ideas and variations on the design of the ablution tub.

Figure 45.1 shows the variation of existing ablution station. As a result, it indicates that the design variation on the ablution tub encompasses the human behaviour. This is because the design of the ablution tub will influence the way humans behave in performing the ablution ritual [14]. Besides that, the existing design of ablution taps will also enhance its function. According to Miswan, the tariff system that provides penalties for water wasting and piping gadgets in buildings and residential, commercial, institutional and industrial areas should be designed systematically in order to save water [15].

45.3 Research Methodology

A survey at Masjid Sultan Salahuddin Abdul Aziz (MSSAASS), Shah Alam, Selangor, has been conducted to study the correlation of human behaviour and design in influencing the ablution tub. The research method used is observation and distribution of questionnaires to 100 respondents who were randomly picked based on different backgrounds. The questionnaire covers several aspects regarding the knowledge on ablution ritual, ablution station (ablution tub) and human behaviour in performing the ablution ritual. Therefore, it is also used to obtain the understanding of respondents towards ablution ritual and the ablution station design. The respondents have been divided into two categories, that is, those aging between 20 and 29 years and above 30 years. The reason is to identify how age affects human behaviour towards the design of ablution tub.

45.4 Result and Conclusion

Majority of the respondents show understanding of the correlation of human behaviour and design in influencing the water consumption while performing the ritual in the ablution tub. The result shows that from the 100 respondents, 60 respondents are aged 30 years and above and 40 respondents are in the range of 20–29 years old. In the two categories, it indicated that the majority of respondents agreed that human behaviour influenced water consumption more in performing the ablution ritual compared to the design of ablution tub. Ninety-three respondents answered yes, while the other seven respondents answered no when we stated that excessive water consumption in performing ablution is influenced by human behaviour.

Moreover, 84 respondents answered no and just 16 respondents answered yes when we stated that the excessive use of water in performing ablution is influenced by the design of the ablution tub. The details are shown in Tables 45.1, 45.2 and 45.3.

Table 45.1 shows the cross tabulation between age and perception on water consumption (human behaviour). From the crosstabs analysis, it assumes that the

Table 45.1 The crosstabs analysis between age and perception on water consumption (human behaviour)

		Perception on water consumption causes (human behaviour)		
		Yes	No	Total
Age	20–29 years	36	4	40
	>30 years	57	3	60
Total		93	7	100

Table 45.2 The crosstabs analysis between age and perception on water consumption (the ablution tub design)

		Perception on water consumption causes (the ablution tub design)		
		Yes	No	Total
Age	20–29 years	5	35	40
	>30 years	11	49	60
Total		16	84	100

Table 45.3 Perception on water consumption

No	Perception	Yes (%)	No (%)
1	Perception on water consumption that is caused by human behaviour	93	7
2	Perception on water consumption that is caused by the design of ablution tub	16	84
3	Perception on the need of product design water control system to be implemented	89	11

respondents perceived that the human behaviour actually influences the ablution tub. This is because behaviour is a natural act. Conserving water during ablution is challenging due to the difficulties to control human behaviour while performing the ritual in the ablution tub. However, when we stated that excessive water consumption in performing ablution is influenced by the design of the ablution tub, it showed that the respondents did not agree with the statement. As a result, 84 respondents answered no and just 16 respondents answered yes, as shown in Table 45.2.

Based on the result in Table 45.2, it shows the cross tabulation between age and perception on water consumption (the ablution tub design). Based on the crosstab analysis, it assumes that the respondents perceived that the ablution tub design does not influence water wasting. It shows that most of the respondents do not agree that the ablution tub design would influence the water consumption while performing the ablution ritual. From the results, the water consumption influenced by human behaviour and the design of ablution tub can be compared; it is shown in Table 45.3.

Table 45.3 shows the correlation between water consumption and human behaviour; it shows that 93% of the respondents agree to the statement that water consumption is influenced by human behaviour. Most of them do not agree that water consumption is influenced by ablution tub design. Only 16 % agrees with the statement and the 84% does not agree with it.

As a conclusion, human behaviour and the ablution tub design influence conservation of water in performing the ablution ritual, and humans need a system to control their behaviour while performing the ablution ritual. It is explicit that when we stated the need for a product design control system for ablution tub, most of the respondents agreed with the statement; 89 respondents answered yes, and therefore,

11 respondents did not agree with it (see Table 45.3). It is because human behaviour is something natural that needs a tool to control it and the ablution system will be able to control their habit in conserving water [16].

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Chapter 46
Enhancement on Visual Communication for Preschool Education Using Transmedia Approach

Fazlina Jaafar, Farrah Hanani Ahmad Fauzi, and Wan Nor Raihan Wan Ramli

Abstract This study will be focusing on the component of preschool curriculum developed by the Ministry of Education. The component of preschool curriculum will be constructed digitally using transmedia approach. Through this study it is our hope that a fun learning environment can be actualized by exposing the students with such approach. The utilization of different media also hopes to encourage constructive learning and collaborative classroom discussion which in turn can hopefully make learning more playful but at the same time structured. This paper will also discuss the many problems in transferring a certain curriculum module using animation approach.

Keywords Transmedia • Visual communication • Preschool curriculum • NPE (National Philosophy of Education)

46.1 Introduction

The philosophy and terminology of preschoolers are children from 4 to 6 years old [1]. They learn to express needs, wants, ideas, and feelings from the beginning. They learn to enjoy language for itself such as play words, phrases, and sound. Adults are expected to teach concepts such as colors, shapes, and even numbers and letters through activity approach.

This is where educators and parents will give the best education before the children put their first step at school. Parents, childcare providers, and preschool teachers are unaware that 0–6 years of age are the primary developmental years, which are the critical periods for the development of many areas, including the

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habitual ways children respond to learning. There are many more to preschooler's education than setting up activities. Education happens during free playtime. Doing activities with just a small part of education, students will learn through experience as they manipulate the things they discovered. The preschool child learned these abilities and skills much better, and we will know how to evaluate the child progress. We need to recognize that children learn by seeing and hearing the same thing in different ways. Most of preschool centers use different kinds of methods to deliver the new ways of teaching. Many studies using a variety of methods demonstrate that children's comprehension of education programs improves with development in producing Malaysian citizens who are knowledgeable and competent, possess high moral standards, are responsible and capable of achieving a high level of personal well-being, and are able to contribute to the harmony and betterment of the family, society, and the nation at large. In the past, preschool education was not part of the formal education system. Preschool education for children aged 4–6 years old was mostly conducted by the private sector in the urban areas and various government agencies. Therefore, the government has developed policies, programs, and strategies for children education up to the year 2020. The National Philosophy of Education (NPE) mission and objective is to emphasize on the holistic development of every child that covers the intellectual, emotional, physical, and spiritual aspects. The aim of preschool education is to strengthen the acquisition of fundamental skills such as socialization process and personality development. The challenges in Malaysian preschool are many and diverse according to the various demographic and economic areas. In an urban setting, it is common for children to have more than 2 years of preschool program before they enter the primary one.

The philosophy of national education encountered in Malaysia is one of the government continuity and ongoing efforts toward developing the individuals' potential in a holistic and integrated manner, so as to produce individuals who are intellectual and spiritually, emotionally, and physically balanced and harmonic. The curriculum is dynamic, child centered, and responsive to the diversity of populations in each classroom. All preschool centers have to abide by the curriculum guidelines set by the Ministry Of Education. Nevertheless, the agencies running the preschool are free to choose the medium of instruction to be used in their establishments. The primary skills taught at this level are communication, social, and other skills in preparation for primary schooling. The general objectives of preschool education are to enable the children to develop love to their country, be well mannered and practice moral values, master essential communication skills, respect the national language, and master the primary of the English language. Evaluation of children performance is part of the preschool program. Learning is the goal of task and normally teachers design activities in order to engage children in learning outcomes [2].

During the last decades, the availability of educational software has been increasing. Children are especially likely to be influenced by television. Information technology infiltrates all levels of education for children. Television is part of the

learning tools used by children for all ages. With the latest technology and demand of multimedia learning, education cannot only be delivered from reading books and looking at printed pictures; there are so many ways nowadays for educators, parents, and children to have the opportunities to customize the learning process such as smart tablets. The use of technology in informal learning settings is one of the considerable interests to educational research. Nowadays, children have easier and faster access to technology. Educators must seek out what children are learning through the informal use of digital technologies. The utilization of different media will encourage constructive learning and create education more meaningful. The involvement of the respondent will determine the usage of digital application to preschool education. This study can have the obvious tendency to increase exposure to visual communication through digital application within educational media and create a fun learning environment to the preschool students. Furthermore, it is likely that we can learn from observing these interactions and use different ideas to help design new approaches to formal education.

Transmedia storytelling (also known as transmedia narrative or multiplatform storytelling) is the technique of telling a single story or story experience across multiple platforms and formats using current digital technologies [3]. Various techniques were used in creating content that can attract engaged audiences. In addition, transmedia techniques incorporate all of the social play structures that have sensorimotor skills such as touching, moving, shaking, and others that will create unique learning opportunities. Transmedia is a format of formats; an approach to story delivery that aggregates fragmented audiences by adapting productions to new modes of presentation and social integration. The execution of a transmedia production weaves together diverse storylines, across multiple outlets, as parts of an overarching narrative structure. These elements are distributed through both traditional and new media outlets [4].

Visual literacy implied an understanding not only of the influence of the images but also means of mass communication and as the breeding ground for values, attitudes, and ideas. The extent of visual media's intrusion into our lives can be seen as well in video games, personal computers, and portable information technology gadgets [5]. Visual perceptions through imagery are the subject matter of the images. Pictures can also convey a huge amount of information. If imagery is to be read after type, all aspects of tone, texture, color, scale, composition, and content must be carefully balanced in order to reduce the level of prominence [6]. The aim of the study is to incorporate application as an alternative method of learning and to enhance the preschool curriculum module. This study will also examine the existing National Preschool Curriculum of comprehension: listening skill module. These include analyzing the potential of digital application as an alternative learning tool for the preschool children [7]. To propose an alternative learning by using the application, in order to provide a variety in educational method of teaching and to create a fun learning environment among preschoolers. The utilization of different media will encourage constructive learning, and collaborative classroom discussion will make education more meaningful [8–11]. It will also discuss the problem in

transferring a certain curriculum module in animation approach during the development. It believes that creative integration between theory and practice and development of sensitivity toward children's needs, which means learning in their context and in their potentialities, can create a learning environment and meaningful interactions, which build on existing foundations [12–15]. These studies also have the obvious tendencies to increase sophistically and to be exposed to animations within educational multimedia and create a fun learning environment to the preschoolers [16]. The objective of this research is to study the possibility of visual communication using transmedia approach on digital application for preschool education. In order to develop a new approach in learning and search for an alternative method that can improve preschool education in Malaysia [17].

46.2 Methodology

This study employs the qualitative approach content research, which includes analysis of survey questionnaires and application demo as a research instrument. The populations of the study are preschool students, in which the limitation of study is from registered kindergartens in the Klang Valley area. There are three primary groups identified in the registered kindergarten. The primary groups are Montessori kindergarten, private kindergarten, and government agencies kindergarten. The researcher chooses the groups based on the different approaches of teaching methodology. Using questionnaires and prototype demonstrations, the researcher tested the students' understanding. During the demonstration, the researcher selected the students and the teachers supervised the demonstrations. This prototype testing is to enable the researcher to do comparative data that support the studies. This number of kindergarten is workable and feasible to study because it reflects the result of understanding toward the application demo. The researcher has used simple random sampling in which three groups consist of 10–30 preschool students, each from Tadika Bijak, Tadika Ilham, and Tadika Gemilang. There are two ways in conducting the study. The first phase will involve gathering data and requirement relating to the study. This phase also interconnects with the problem statement and analyzing related journals, books, and articles that quote on the animation and preschool curriculum. The second phase will focus on the development of the instrument. There will be a selected kindergarten that will be involved throughout the survey and prototype testing. This study will use questionnaires to serve as the data collection instrument in this study. The researcher has developed the application demo as a tool to measure the instrument and followed by survey questionnaires as a record of data collection based from the students' understanding toward the demo. The researcher tabulated the survey questionnaires, "face to face" with the student as the respondent. The researcher used the questionnaire to gauge their understanding. In the making of the prototype, the researcher has chosen the learning environment chapter from the sixth module: creativity and aesthetics (Fig. 46.1).

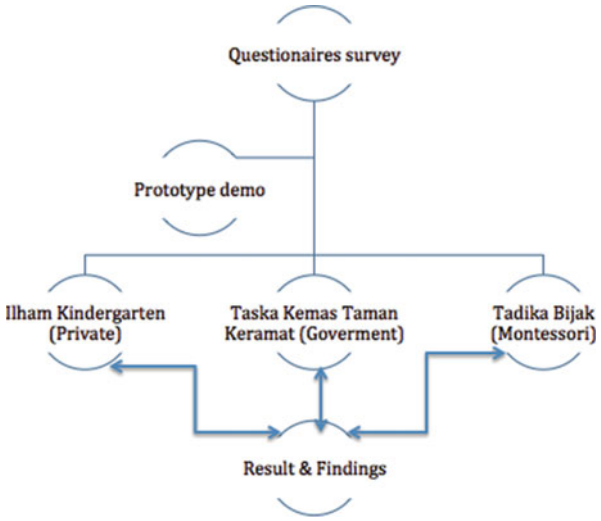

Fig. 46.1 (Research methodology model)

Designs and Development of Test Instrument

The researcher will introduce transmedia application as a medium for learning. The application sequence adapted from the preschool curriculum produced by the Ministry of Education as the platform to support the delivery of education that meets the preschool requirement. Transmedia application is about content and creativity. The application process requires the completion of several distinct steps and several pieces of software used depending on the desired output. Image editing software such as Adobe Illustrator and Adobe Photoshop is used to design the interface of the application. Later, Adobe Flash is used to develop the animation and build the application (Figs. 46.2, 46.3, 46.4, and 46.5).

Questions were developed based on the module and the interface.

- Question 1: Please identify which sound matches with the specific instruments.
- Question 2: Please identify which sound matches with the specific animals.
- Question 3: Please identify which sound matches with the specific vehicles.

46.3 Results and Discussion

Data Analysis

The statistical analysis is based on responses by students from the 3 kindergartens. The researcher studied their understanding and perception toward the demo.

Fig. 46.2 Main screen interface

Fig. 46.3 Screen 1 interface

(i) In the first phase, the researcher has dealt a testing with 25 students of Tadika Bijak. The management has combined the students of ages 5 and 6 in one class. They were provided with close-ended questionnaires with a single response based from what they feel understanding and experience through the demo. The second section of the questionnaires was for teachers to observe the students' understanding about the prototype.

(ii) In the second phase, the researcher dealt with another 10 students of Tadika Ilham, a group of 6-year-old students. The same method implied and followed the same close-ended questionnaires for a single response and teacher's observation.

Fig. 46.4 Screen 2 interface

Fig. 46.5 Screen 3 interface

(iii) The third phase of the demo was at Taska Kemas. There is a group of 5- and 6-year-olds in the class. The same method was applied during the session. The researcher has tabulated the data for analysis after collecting 65 responses from students and three from teachers. The researcher studied the questionnaires for their understanding and perception toward the demonstration (Table 46.1).

Table 46.1 Score of Tadika Ilham

No.	Questionnaires	Result	
		Correct	Wrong
01	Question 1	100	0
02	Question 2	68	32
03	Question 3	100	0

Table 46.2 Score of Tadika Bijak

No.	Questionnaires	Result	
		Correct	Wrong
01	Question 1	100	0
02	Question 2	73	27
03	Question 3	100	0

Table 46.3 Score of Taska Kemas

No.	Questionnaires	Result	
		Correct	Wrong
01	Question 1	100	0
02	Question 2	50	50
03	Question 3	100	0

From the table above, it shows that more than 100 % of students from Tadika Ilham understand the content of the demo. 100 % answered correctly in identifying the sound of specific instrument. 68 % answered correctly and 32 % of the students gave incorrect answers in identifying the animal sound, and 100 % answered correctly for question 3: identify the vehicle sound (Table 46.2).

The table above shows that more than 100 % of students from Tadika Bijak understand the content of the demo. Result shows that 100 % of the students give the correct answer in identifying the sound of a specific instrument. For question 2, in which the respondent identifies the sound of a specific animal, 27 % answered incorrectly, and 73 % gave a correct answer. 100 % gave the correct answer in identifying the sound of vehicles (Table 46.3).

The table above shows that more than 50 % of students from Taska Kemas understand the content of the demo. Result shows that 100 % of the students gave the correct answer for string instrument. 50 % answered incorrectly for the questions in identifying the animal sound, and 100 % gave correct answers for identifying vehicle sound.

46.4 Conclusion

This study focused on the additional learning media for preschoolers by using transmedia approach on digital application. The methods have been described for enriching a new variety of learning processes, content, and environments. Based on the findings of this study, the following conclusions were stated:

(i) Most of the students have shown their interest while watching the demo. This prototype demo will give the understanding to the student when it was used together with the module.
(ii) The usage of a variety of media such as sound, animation, and images will engage the students to learn and enhance their knowledge and will attract them to learn more.
(iii) The contribution of the above methods will create the experience by focus on user's attention and engage them into knowledge and information with fun and excitement. The researcher believes that this method will be more appealing, more exciting, and engaging and will enhance the user's understanding.

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Chapter 47
Acculturation of Peranakan Chinese into Malay Culture in Terengganu: Influence on the Development of Malaysian Modern Art

Razis Izaura, Zalina Mohamad, and Alina Abdullah

Abstract Malaysia is a multiracial country with Islam being the largest practised religion comprising other beliefs such as Hinduism, Buddhism, and Sikhism. Malaysia is also known for multiculturalism because it has a unique multiracial society in which some traditional belief systems are not only tolerated but respected among each other as well. The objective of this study is to explore how the Peranakan Chinese in Terengganu lived and became acculturated to the rural Malays in one of the east coast state in Malaysia, Terengganu, by stepping into age-old traditions. The observation was carried out in Kampung Tiruk, Kuala Terengganu, as it consists of two major religions, Islam and Taoism. It is an ethnographical study of Malay and Peranakan Chinese in terms of their cultural interaction in the said location. Therefore, the main significance of the study is showing the acculturation and ethnic identity between the universal values of the two races, namely, Malay and Peranakan Chinese, until it led to the development of Malaysian modern art scene during the 1930s–1950s; due to the Straits Settlement under British colonization, Terengganu is one of the areas in which there was early settlement by Chinese immigrants.

Keywords Acculturation • Malay • Peranakan Chinese • Modern art

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47.1 Introduction

Malaysia is known as a unique multiculturalism country predominantly Malay and other races and beliefs such as Buddhism, Hinduism, Christianity, Sikhism and Taoism. Thus, one of the objectives of this study is to explore the relationship among the Peranakan Chinese and how they live and become acculturated to the rural Malays in one of the east coast states in Malaysia, Terengganu, by examining their traditional houses too. It is an ethnographical study, and the observation was carried out in Kampung Tiruk, Kuala Terengganu, as it consists of two major races and religious beliefs of Islam and Taoism. Acculturation is the psychological and social counterpart of cultural diffusion [1]. Kok Seong Seo (2003) has defined that Peranakan Chinese are found only in the east coast of Peninsular Malaysia, mainly in the rural areas of Kelantan and Terengganu. Generally, these Peranakan Chinese are engaged in small-scale agricultural activities. These Peranakan Chinese and their descendants are part of the earlier Chinese emigrants. There is no available information on their early existence in the area.

The research would be beneficial in developing good interracial bonding among all groups in Malaysia because it focuses on cross-cultural and social interaction among Malay Muslims and Peranakan Chinese in Kampung Tiruk, Kuala Terengganu. Below is a detailed explanation of how they became acculturated with each other.

Acculturation Identity of Malays and Peranakan Chinese in Kampung Tiruk

The descendants of the Chinese immigrants are called “Peranakan” in Malay society, among the Peranakan who have not maintained their original identity of culture such as language, clothing, food, etc., although they are very proud of their Chinese heritage. Traditional customs of the local Malays have been influenced, but they are still maintaining the ideology of Chinese rituals and beliefs. The Peranakan Chinese has accepted most of the Malay lifestyle and cultural values of the Malays in their daily life. Was this acculturation identity designed or natural? Did the Peranakan Chinese families try to quickly acculturate into Malay custom because they were a minority among the local Malays of Terengganu? However, the social interaction as much as acculturation between the Peranakan Chinese and local Malays started as early as in the second generation. They all live very close to the Malays and behave like Malays, so the custom of the Malays was naturally absorbed fast because they enjoyed a relationship with both communities. Experience in Kampung Tiruk gives an opportunity to appreciate nature while enjoying the culture and ethnic communities. Generally, the Kampung Tiruk is nestled against the tropical rainforest, and these Peranakan Chinese villagers are engaged in small industries of agricultural activities.

The objective of this study is to explore the influence of Peranakan Chinese in Terengganu to the development of Malaysian modern art, by examining the artworks of Chinese Malaysian artists. They are Chan fee Ming, Lai Foong Moi and Cheong Soo Pieng. It is also an ethnographical study, and the observation was carried out in Kampung Tiruk, Kuala Terengganu.

47.2 Method

The artwork of three Chinese Malaysian artists has been chosen as they show a lot of interest in the culture of Terengganu people in their drawings. The study analyses a few of the artworks which reflect the life of the Malay women. The three artists are Chan fee Ming, Lai Foong Moi and Cheong Soo Pieng.

47.3 Results and Discussion

Peranakan Chinese in Kampung Tiruk

Language

From the second generation, acculturation identity began with the language among local Malays. Many of the Peranakan are Taoists, which means that from the earlier generation to the next generation, they keep on practising those beliefs mix with all the Chinese and Malay culture. At home, they speak Hokkien mixed with Malay (pure Terengganu's dialects). Some of them know Malay language better than Chinese language. They used to address each other in Chinese titles among relatives such as 'Ye Ye, Er Sao and San Jie', but they also use the Terengganu dialect like 'Mek (ladies) and Awang (man)' which is different from Peranakan Chinese in Malacca as they use 'Baba (man) and Nyonya(ladies)'. Some of the customs and rituals are still being practised by the people. In those days in Kampung Tiruk, there is no Chinese school; so basically, all the Chinese had to go to Malay school where they learnt Malay language and Jawi. Hence, the older generation probably 70 or 80 years old nowadays can still read and write in Jawi or calligraphy but not the younger generation because of the advancement of technology. Nowadays, most of the younger generations migrate to the city to work and for education.

Outfits

The interesting experience that are rarely seen in urban areas is when Peranakan Chinese women always dress in Malay costumes such as kebaya (potong coat) and sarong (Batik Jawa) and the men love to wear white shirt (pagoda shirt) with pelikat.

It clearly portrays the acculturation of the Malay culture, when the Peranakan villagers are always encouraged to dress modestly, and it is norms for the women to dress conservatively that fully covers their bodies. It clearly shows that the Peranakan Chinese's level of acculturation to the Malay culture and values is the highest in comparison with the other groups. The Peranakan Chinese is therefore considered as part of the Malay peasants rather than the mainstream Chinese.

Foods

It is an interesting and enjoyable experience when in most homes, Peranakan Chinese in Tiruk have their meals while being seated on a pandanus mat or Tikar Mengkuang in the dining area. As the Malay lifestyle, they also eat using the fingers during breakfast, lunch, teatime, and dinner. Peranakan cook and eat Malay foods like asam pedas, budu, belacan, ikan singgang and ayam percik, to name a few. This is very well versed in Malay food. The smaller communities in Kampung Tiruk do not even take pork to show their respect to their Malay neighbours. The most popular teatime snacks in Kampung Tiruk are Pulut Lepa, Roti Paung, Keropok Ikan Parang and an assortment of Kuih with a delicious taste and interesting variety of shapes and colours.

Rituals

Peranakan Chinese in Tiruk received education from the residential Malay school, so they never get opportunities to learn education in Chinese school. Even though they are influenced by Malay customs, Peranakan Chinese in Kampung Tiruk, Kuala Terengganu, still practise the traditional Chinese customs such as the special Chinese festivity of celebrating birthdays with long-life noodles and on Friday nights they burn incense at the temple.

Houses

The uniqueness of architecture of Malay traditional houses is not only showing their function as ornaments, but it is also telling the society about Malay lifestyle which includes religion and their custom. One of the best ways to understand the traditional heritage of Peranakan is to live in a Peranakan village. Terengganu Peranakan in Kampung Tiruk still live in a house called 'Rumah Potong Belanda'. The houses have two Chinese written characters at the main entrance which mean peace, prosperity and long life. At the centre of the living room, there is a place for ritual activities where they pray to the ancestors. However, some of the houses are left and abandoned since the new generation moved to other places (Fig. 47.1).

Fig. 47.1 Traditional Peranakan houses

Arts and Cultural Performance

In terms of art, of course there is a lot of art in Kampung Tiruk in the early days, but now it is already disappearing. In Kampung Tiruk, the traditional shadow play theatre or wayang kulit and Mak Yong is another interesting performance among Peranakan Chinese in the early days. The show is performed and adapted from Malay ancient epics with a master storyteller, called Tok Dalang. The Wayang Kulit is conducted with a white cloth screen and with the use of appropriate movement and traditional Malay music. But when we traced back from the carving motifs, probably many villagers of Peranakan Chinese in Tiruk are skilled artisans in woodcarving. With beautiful designs, they dedicate a great deal of time and effort towards creating these exquisite pieces of arts and crafts, for instance, the dragon they carved on the wood and mixed with Malay motifs such as Awang Larat, leaves and flowers. In fact, most of the traditional Peranakan houses in Tiruk are built from hardwood with intricate motifs and beautiful designs. In Kampung Tiruk, beautiful woodcarvings can be found also on so many things, such as the handle of traditional Keris, boats, mirror frames and many more.

The Malay Influence in the Chinese Artists' Artwork

Seeking job opportunities was the economic reason which attracts the Chinese to settle in Malaysia. Historically, Chinese mainland faced overpopulation and natural calamities and the exploitation of peasants by landlords brought tens of thousands of Chinese out of the coastal provinces of China to Nanyang [2] (Tan et al. 2005, p. 9). The majority of those who joined the migration into Malaysia came to work in the land or be involved in trade. Some of them negotiated with the Malay rulers and chiefs of tin mines to acquire the lands for plantation or cash crops [3] (Zuriati Mohd Rashid). Malay lifestyle in the east coast of Terengganu probably had directly or indirectly influenced the development of the early modern art among artists in groups such as the Nanyang. In a multiracial society living in Singapore, the Nanyang Academy of Fine Arts in Singapore had a predominantly Chinese outlook in terms of staff and students until the late 1950s. The academy was founded in 1938 by Lim Hak Tai, who graduated from Amoy Art Teacher's Training College in China, financially supported by a group of Chinese businessmen and guilds of Singapore. The committee, the teaching staff and the students were Chinese, and most of the students who graduated took up teaching posts in Chinese schools in Singapore and Malaya. The Nanyang Academy of Fine Arts is known for their efforts in the development of Malaysian modern art, involving their members such as Chen Wen His, Chen Choong Swee, Georgette Chen, Kuo Ju Ping, Lai Foong Moi, Chia Yu Chian, Cheong Soo Pieng, and Khoo Sui Hoe who produced artworks with subjects of local landscape, kampong scene and local fruits and mastered the use of materials such as watercolour and oil. They are focused on traditional Malay rural life as a subject matter of the painting. This

could be seen, for example, in Lai Foong Moi, 1959, "Morning in the Kampung", Oil, 39″ × 21″ (Figure). This painting shows that the artist's life was very close to the Malay society, depicting their childhood experience. It depicted a moment of Malay environment and life that took place in the beautiful landscape of the Malay villages or Kampong. The scenario in the painting portrays the traditional Malay houses which are built from hardwood with intricate motifs and beautiful designs surrounded by a beautiful scenery of coconut trees. It also shows a Malay female figure that is standing in front of the Malay house observing the scenery, wearing a traditional costume of Baju Kurung and sarong (Batik) with a scarf on her shoulders. It can be strongly suggested that the artist had situated himself in the Malay society lifestyle in the earlier days and reflected it into exquisite pieces of painting. Most of the Nanyang artists were self-taught. In the early time, the artists are usually encouraged to develop their own ideas or self-expression in order to find the character of style and artistic expression. In the "Preface" of the group's first exhibition catalogue in 1956, it was written that [4] (Yeoh Jin Leng) "Memang tidak wujud apa-apa aliran Kebangsaan atau gaya melukis yang dipupuk, tetapi dari perbincangan, minat dan semangat, para pelukis ini menunjukkan gaya tersendiri dan dari kepelbagaian ini ternyata masa hadapan adalah cerah" (There is no national style or certain developed style, but from discussions, interests and spirits, these artists showed their own various distinct styles and from these variations their futures are definitely bright) (Figs. 47.2, 47.3 and 47.4).

Fig. 47.2 Lai Foong Moi, 1959. "Morning in the Kampung", Oil, 39″ × 21″

Fig. 47.3 Cheong Soo Pieng, 1959. "Tropical Life", watercolour, 88.9×45.6 cm

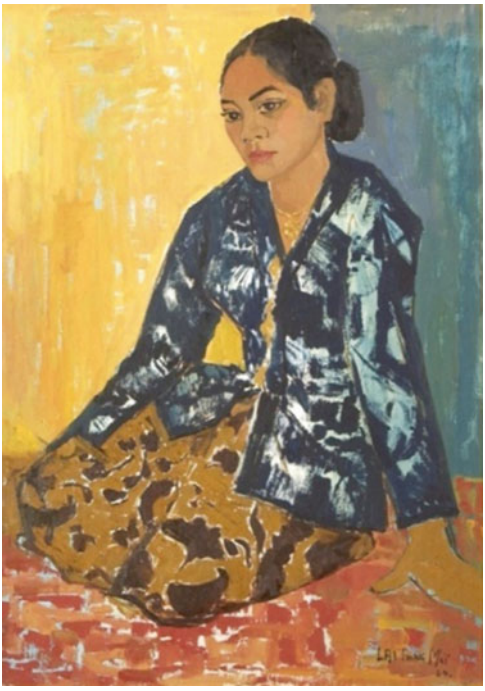

Fig. 47.4 Lai Foong Moi, 1959, "Gadis Melayu", Oil, 36″×25″

47.4 Conclusion

Most of the younger generation nowadays may not notice and appreciate this unique cultural identity of Kampung Tiruk that we have because it has not really been promoted. It is very important for the Tourism Ministry, NGOs or other communities to bring it out. To preserve the culture heritage of Peranakan Chinese in Tiruk, the younger generation should understand and learn about the best value behind the culture of Tiruk, and then we can leverage it to the next level.

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Chapter 48
The Potential of Photo Manipulation as Visualization Technique in Advertising Campaign

Fazlina Jaafar, Azian Mohd Zain, and Faiz Marzuqi Mustaffa

Abstract This paper describes visualization technique in using photo manipulation for advertising campaign. This technique allowed audience to view photorealistic examples of proposed design prototypes that were seamlessly placed into photographic images of the specific case study. With differences in advertising execution, photo manipulation is one of the solutions to recall the consumer's attention. In order to achieve a higher awareness about the book village, the researchers proceeded to investigate the possible approaches most effective in delivering the messages. The finding of this research shows that photo manipulation is the preferred method of execution. This study will observe the potential of photo manipulation as the chosen technique in advertising campaign for Book Village in Langkawi as case study. The Book Village in Langkawi hit a snag a year after its launch. Now closed because of lack of funds and revenue, this village was investigated to study its promotional efforts and activities. It is found that the village has low awareness amongst teenagers and low presence online. Photo manipulation is related with photography techniques using models, backgrounds, lighting and others that are applied by using photo editing software [1]. The research is a visual communication design study taken to investigate previous promotional activities, then seeking new concepts and delivering it the unconventional way. The utilization of different media in creative advertising ideas can get the audience's attention anywhere through media planning. Concerned with the research, the thesis is about to study the potential of using photo manipulation as a visualization technique in advertising campaign.

Keywords Photo manipulation • Book village in Langkawi • Visualization technique • Promotion

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48.1 Introduction

Kampung Buku Malaysia (Malaysia Book Village) in Langkawi was an idea from Tan Sri Sanusi Junid, the former Chief Minister of the State of Kedah. The Malaysia Book Village in Langkawi was opened in the year 1997, officiated by the former Prime Minister, Tun Dr. Mahathir Mohamad [2].

It is the first and only book village in Southeast Asia which is a part of the International Book Villages [3, 4]. Malaysia Book Village in Langkawi is one of the 12 villages around the world wherein the surrounding environment was developed and maintained for added attraction to visitors to relax while reading as opposed to reading in a building. In his visits to other book villages in the United Kingdom and the Netherlands, these book villages were developed in villages of historic interest or of scenic beauty, very much suited with the aura of the Langkawi Island. The Malaysia Book Village in Langkawi would offer readers a new experience, reading in a place amongst nature and culture, as opposed to a reading experience in buildings such as libraries or bookstores in a mall.

The Book Village of Langkawi is special because it is located at the recreation area of interest in Lubuk Semilang, Ulu Melaka, with a backdrop of a village filled with shops and book fair halls. A traditional Malay house-shaped building is surrounded with natural environment with shady trees, and this creates a new reading experience in a comfortable atmosphere. The village is housed in an area of 202 ha with a focus on about 14 ha of development with six big buildings displaying books of a wide range of subjects and interests [5].

As of the date of this research, the village is closed due to lack of funds and revenue. However, plans to revive the village are under way, and this research will look closer into the promotional activities which may be the underlying factor for the village to be closed.

Photo manipulation has been the most popular solution to most designers because it is easy to produce. The process to make it is faster and easy. Photo manipulation is related with photography techniques using models, backgrounds, lighting and others that are applied using digital manipulation software. Multiple photos are needed to create the image composition in a single composited image. Today, 3D elements are used more to add extra elements or even locations and backgrounds. This kind of image composition is widely used when conventional photography would be technically too difficult or impossible to shoot on location or in the studio (Fig. 48.1).

Fig. 48.1 Book Village in Langkawi official logo

48.2 Methods

This study employs the qualitative approach content research, which includes analysis of survey questionnaires and advertising application as a research instrument. Initial investigation on the promotional activities was done via visiting the village, capturing images and checking its online presence (Fig. 48.1 [6, 7]). The researcher has used two types of data collection which are the primary and secondary data. Primary data includes observation and interview with the Manager of the Kampung Buku Malaysia (Malaysia Book Village) in Langkawi Mr. Terry Anak Katut to get the latest information about the Kampung Buku Malaysia and the plan for the book village. Online survey also is used as data collection.

- The road signage leading into the location has been erased (Fig. 48.2).
- The village is abandoned and closed (Fig. 48.3).
- The unattractive wayfinding system (Fig. 48.4).
- The promotional activities are not attractive and small in size. There is no official website, but the promo is placed within other websites that promote the island (Fig. 48.5).

For the secondary data, references are all from related materials such as books, posters, print ads and others. The researcher also had administered a questionnaire to find out the awareness levels amongst teenagers. Of the 100 respondents who gave feedback, 80 % were unaware of the Book Village's existence and have not seen any advertisements on the village. Some respondents think it is a library. The researcher also asked what type of design they would prefer to see in its

Fig. 48.2 Book Village road signage

Fig. 48.3 Book display

Fig. 48.4 Book Village wayfinding

advertisements, in which straight visual was identified as opposed to using typography or letter-style design. For poster design, it was identified that photo manipulation was the preferred method of execution compared to photography or illustration (Figs. 48.6, 48.7, 48.8 and 48.9).

Designs and Development of Test Instrument

Photo manipulations allow the researcher to explore creativity and create stunning and surreal works of art. The image editing software Adobe Photoshop is used to create various elements and textures to design a dramatic montage. The gradient tool and blending options are used to work the lighting and overall tones (Figs. 48.5, 48.6, 48.7, 48.8, 48.9, 48.10, 48.11, 48.12, 48.13, 48.14, 48.15, 48.16,

Fig. 48.5 Internet promotion

Fig. 48.6 'Gandhi Book Store' using the photo manipulation for their advertising promotion

Fig. 48.7 San Diego Zoo advertising campaign

Fig. 48.8 Film Journey 2: The Mysterious Island poster design

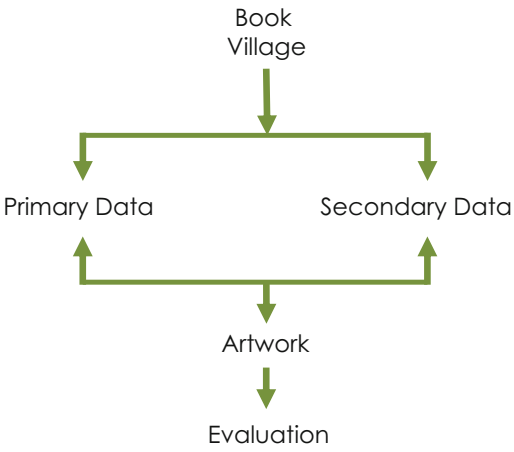

Fig. 48.9 Methodology framework

Fig. 48.10 Talent photo shoot

and 48.17 [2, 7–13]). In this process, the researcher has to know the objective which derives logically from the stated problem. The first phase is to capture talent images using a blank background screen. Creative retouching on image manipulation is used for advertising photography. In technical retouching, one of the most prominent disciplines is image compositing. The researcher uses multiple photos to create a single image (Figs. 48.10, 48.11 and 48.12).

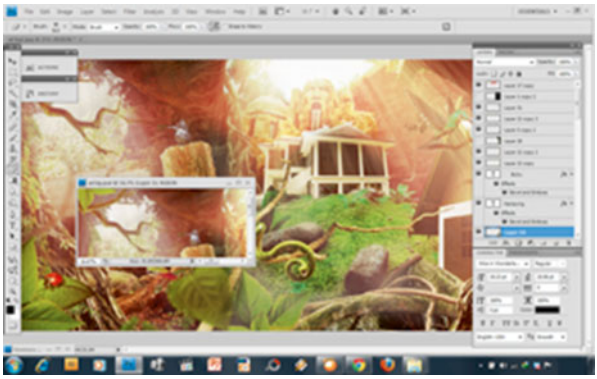

Fig. 48.11 Image manipulation process 1

Fig. 48.12 Image manipulation process 2

48.3 Results and Discussion

Data Analysis

The statistical analysis of online survey was based on 81 responses. The researcher studied their understanding and perception towards the questionnaires. Online surveys provided close-ended questionnaires with a single response based from the target audiences' knowledge and experience about book village (Figs. 48.13, 48.14, 48.15 and 48.16 [14]).

The key issue in this visual research is the manipulation of visuals using digital techniques in advertising campaign. Some advertisements may rely heavily on photo manipulation to make the outcome more interesting and appealing. The respondents' choice of approach is manipulation technique as illustrated from the following examples (Fig. 48.17).

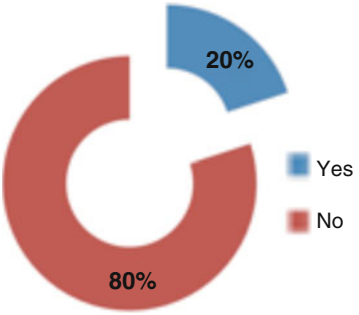

Fig. 48.13 Question 1: the existence of Book Village in Langkawi

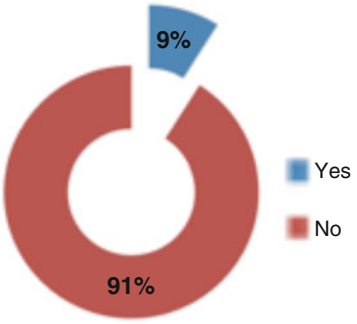

Fig. 48.14 Question 2: ever visited Book Village in Langkawi

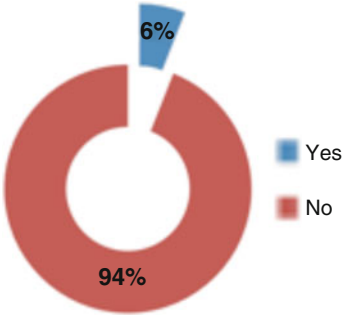

Fig. 48.15 Question 3: awareness in advertising promotion on Book Village in Langkawi

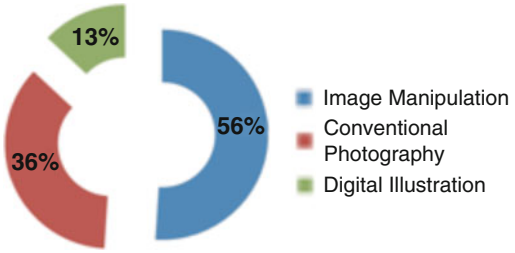

Fig. 48.16 Question 4: preferred technique used in advertising promotion in Book Village in Langkawi

Fig. 48.17 Result of manipulation process

48.4 Conclusion

This study focused on the new advertising promotion for Book Village in Langkawi using image manipulation on digital application. The methods have been described for enriching a new variety of advertising campaign. The selection of visual manipulation that matches the respondents' feedback for a more interesting and creative way of presentation is hoped to gain a positive response. The next step would be the pretesting phase.

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Chapter 49
Developing Sarawak Motif Elements of Ventilation Pattern Through Ceramic Stoneware Materials

Mohd Fadhi Yakub, Verly Veto Vermol, Rusmadiah Anwar, and Oskar Hasdinor Hassan

Abstract Sarawak is one of the largest states in Malaysia which is located in Borneo Island that is rich with cultural influences of various indigenous races such as Iban, Melanau, Penan, Kayan and Kelabit. The evolution of Sarawak traditional housing model design is inspired by the influence of traditional natural ventilation and aesthetics concepts. Ventilation is a process of the filtration of air movement inside and outside of a building. It is divided into a process of air circulation system known as infiltration and exfiltration system. Common air ventilation nowadays is powered through natural and mechanical force. The research will be focusing directly on natural force ventilation. Literally it is the cheapest and easiest way of attaining a sustainable wind power ventilation system. Previous study shows that nowadays modern housing models are no longer adapting similar value in design element concept especially on the critical Sarawak traditional housing motif, and there is lack of studies on house planning for proper air ventilation. This study aims to identify ideal ceramic material composition and parameter for ventilation while assimilating the proper channel of ventilation with critical design forms influenced by Sarawak motifs. This study used two methods, which are standard ceramic lab and a series of morphological design charts consisting of eight phases, in order to determine a suitable design for Sarawak motifs which was implemented on the ventilation model. The research was conducted to keep the heritage for the future gen-

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eration; yet the traditional sustainable technology can be improved to suit the new modern housing model especially in the process of developing eco-green and sustainable housing design.

Keywords Ventilation • Ceramic material • Sarawak motifs

49.1 Introduction

Sarawak is one of the largest states in Malaysia, which is located in Borneo Island that is rich with cultural influences from various indigenous races such as Iban, Melanau, Penan, Kayan and Kelabit. The evolution of Sarawak traditional housing model design is inspired by the influence of traditional natural ventilation and aesthetics concepts. The Sarawak motifs are influenced by Mother Nature such as leaves and animals. These all Sarawak races are rich in their own culture and beliefs. Sarawak crafts such as pua kumbu, textile products, beads, etc., are adapted to their own motifs. Its motif is more related to common symbols such as birds, deer, snakes, leeches, centipedes, squirrels, frog, flower and fruits. The highest symbols are human and the spirit [1]. Nowadays, the unstable air conditioning on Earth is tremendously changing and causes the unhealthy air. According to the Energy Agency [2], the electricity sector globally produced 41 % of the total CO_2 emissions in 2009 [2]. In order to reduce our national energy consumption, building scientists and engineers must develop methods to reduce the energy used by buildings (Chris Bibby) [12, 3]. The use of natural, as opposed to mechanical, ventilation is one such method [4]. Ventilation is one solution to creating and generating good conditional healthy air. Based on M.Z.I. Bangalee [2], a ventilation system is essential for thermal comfort and good health of occupants in a living space [6]. There are three types of ventilation: mechanical, hybrid and natural. Chen Yifei [3] said that there are three kinds of natural ventilation which includes thermal natural ventilation, wind pressure natural ventilation and a combination of both [7].

This study focuses on developing the natural ventilation. Natural ventilation system gives more benefit on the green technology of the modern house air circulation system and consumes less energy, which reduces environmental pollution. Based on Ruan Fang [4], more and more people were aware of the importance of natural ventilation and try hard to increase probability of natural ventilation in modern buildings to reduce energy consumption and pollutant discharge [8], and according to Roberto Z. Freire [5], natural ventilation has been widely adopted in different ways as a strategy to reduce energy consumption and improve thermal comfort condition in buildings [9]. Natural ventilation is not usually use nowadays. Based on other studies by Tobiaz Schulz [6], natural ventilation is still not widely applied, because only limited information is available on the thermal [10].

Ventilation is the process of changing or replacing the air from inside or outside the building. Exfiltration is the leakage of room air out of the house, and infiltration is the process of air travel from the outside to the inside of the house. This study is

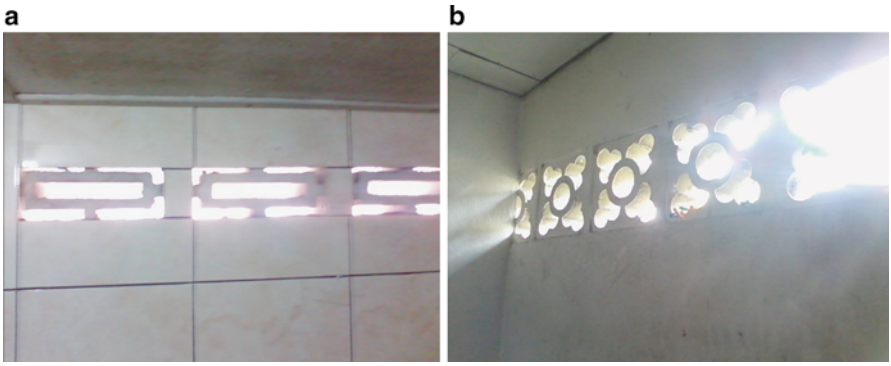


Fig. 49.1 (**a**) The existing ventilation design. (**b**) The various designs of ventilation

intended to develop the natural ventilation design. The basic concept of the natural ventilation is through opening the windows to allow air to pass through the inside and outside of the house. Through the ventilation process, it replaces the noxious air and provides healthy air. This is to provide high indoor quality air. Its main function is to control the room temperature, replenish oxygen and remove the moisture smoke, heat, dust, airborne bacteria and carbon dioxide [11]. The general purpose of ventilation is to provide healthy air for breathing by both diluting the pollutants originating in the building and removing pollutants from it [8], 12]. Figure 49.1 shows the existing modern ventilation on modern houses.

Ceramic material was usually used for the manufacturing of products such as sanitary ware, tableware and tiles. It can be classified as inorganic and non-metallic materials. The characteristics of ceramic material are hard, wear resistant, electrical insulator refractory and thermal insulator [15]. Other characteristics of the ceramics are their own porosity in the body and their potential to absorb heat. According to Tsuneharu Nitta [17], the porous ceramic easily absorbs water vapour throughout the pores [13]. The basic formulation of the clay is Al_2O_3 which is in the body. There are many types of ceramic body such as stoneware, porcelain, earthenware and terracotta. Ceramic materials can withstand high temperature. Creating the ceramic product is through six stages: processing the material, forming process, drying process, firing process, glazing application process and glazing and firing process [14].

49.2 Methods

The research will be segregated into two ways which are by conducting the laboratory experiment and using the morphological method to identify suitable motifs for the ventilation design. For this matter, there are five classifications of the test bar developed using the ceramic stoneware body which is the main component, and one of the test bars was recorded as master sample. The test bar dimension will be 10 mm in length as shown in Fig. 49.2. Body formulation parameters are segregated

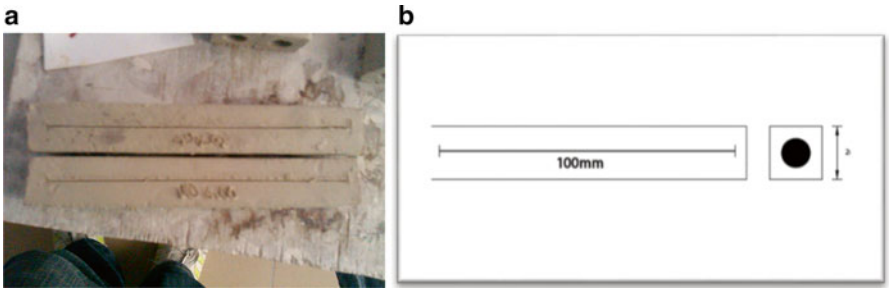


Fig. 49.2 (**a**) Actual test bar before firing. (**b**) Dimension of the test bar

Table 49.1 The standard based on ANSI

Types of body	Density	Water absorption (x), %
Non vitreous	Low dense	X>7.0
Semi vitreous	Medium dense	3.0 <x<7.0
Vitreous	High dense	0.5<x<3.0
Impervious	Extremely dense	0.5>x

as per Table 49.2 which shows information about the test bar samples. The process of experimenting can be conducted repeatedly in order to gain information.

Ceramics fired with high temperature are very strong, and its porosity condition is lower with values ranging from 0.2, 25, 50, 100 and 300 to 500 μm [2]. The stage is conducting tests using the two methods, which are testing the breaker strength and testing through the modulus of rupture (MOR). Testing through MOR measures all the dimensions of specimen on different edges of the test bar. Figure 49.2 shows the breaking strength test through the MOR machines [16]. This testing was conducted to test and measure the essential breaking strength substances of the stoneware material. This test is normally 80 times of the load, which require breaking the specimen by using the MOR machines. Porosity test is conducted by dipping the specimens into the water and identifying the porosity level of the clay. The standard of water absorption source was taken at the American National Standards Institute (ANSI) [9]. Table 49.1 shows the standard based on the American National Standards Institute (ANSI).

Through the result, the next step will be aligning the traditional Sarawak motifs to be adapted on the ceramic ventilation block. A series of morphological design chart consisting of eight phases will be used in order to determine the suitable design for Sarawak motifs to be implemented in modern housing models. This method was introduced by Roozenberg (2005) [10] and shows the series of morphological chart suitable to find the best design of the Sarawak motifs. The first stage is studying the main function of ventilation by identifying the Sarawak motifs and the function and subfunction of the ventilation. Next, matrixes were constructed through these subfunctions and its rows. Each of the rows is then filled up with solutions of

particular parameter based on design reasoning. Through the study of design variability, the design can be conceptualized, analysed and evaluated. Finally, sketches were drawn based on the idea for the ventilation, and further details for the design are added last.

49.3 Result and Discussion

Parameter Stoneware Body

Table 49.1 shows the master formulation of the stoneware clay. This formulation consists of the main formulation of stoneware clay: kaolin, ball clay, potash feldspar, silica and calcium carbonate. Based on Yakub, each formulation differs by the amount of kaolin, ball clay, potash feldspar, silica and calcium carbonate [7]. Each material has its own characteristics and strength, for example, kaolin. The function of kaolin is to generate the potential of white colours of the body. It can control the hue of the colours on the clay. All these materials change, and it will affect the body during the firing process and the forming process. All of the material is fired in high temperature to create the strength of the structure on ventilation block. All the parameters of the material, as well as development of variational formulation with different percentages of the materials, are shown on Tables 49.2, 49.3, 49.4 and 49.5.

Table 49.2 Master formulation for the stoneware clay

Material	Percentage of material (%)
Kaolin	40
Ball clay	15
Potash feldspar	30
Silica	15
Calcium carbonate	2
Water	45
Sodium	0.3
Specific gravity	1.69

Table 49.3 Stoneware parameter for specimen 1

Material	Percentage of material (%)
Kaolin	40
Ball clay	15
Potash feldspar	30
Silica	15
Calcium carbonate	5
Water	45
Sodium	0.3
Specific gravity	1.69

Table 49.4 Stoneware parameter for specimen 2

Material	Percentage of material (%)
Kaolin	40
Ball clay	15
Potash feldspar	30
Silica	15
Calcium carbonate	10
Water	45
Sodium	0.3
Specific gravity	1.69

Table 49.5 Stoneware parameter for specimen 3

Material	Percentage of material (%)
Kaolin	40
Ball clay	15
Potash feldspar	30
Silica	15
Calcium carbonate	15
Water	45
Sodium	0.3
Specific gravity	1.69

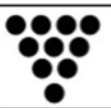
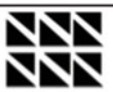
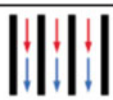
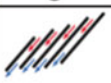
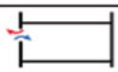
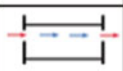
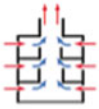
Morphological Chart

This morphological chart aims to study the alignment on design and its mechanism of the air flow principles. It is separately divided into 5 rows and 5 columns which concentrate more on the holes of the ventilation, the structure of the assembling the block, motif design and the principles of the ventilation. This chart will show the clear alignment of the 5 columns and its function. This chart is intended to show the air movement passing through the ventilation wall. Another intention of this study is to examine the arrangement of the structure by studying the arrangement of the ventilation blocks. The third intention is on the wind direction of this ventilation block. There are various types of wind direction on the ventilation blocks. The other studies are about the Sarawak motif alignment which is by using two Sarawak motifs and finding the most suitable arrangement. Lastly, it aims to study the wind mechanism of the wall. This mechanism is more on arrangement on the suitable arrangement for the house or the buildings (Table 49.6).

49.4 Conclusion

In this study, it is found that implementing natural ventilation provides more benefit on human behaviour and provides a soothing environment for modern housing models nowadays. This study also suggests reducing the consumption of electricity

Table 49.6 Morphological chart

		1	2	3	4	5
Air movement	Holes					
Arrangement of blocks	Structure					
Wind Direction Control	Direction					
Motifs Alignment	Unification					
Design mechanism	Principles of Ventilation					

and bringing the eco-green environment. This study aims to create the better life by giving healthy air circulation on modern houses. Further research is needed to preserve our Sarawak culture.

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Chapter 50
Perception of Readers Toward the Crime Photographs from the Mainstream Malaysian Newspaper in Kuala Terengganu

Farihan Zahari and Mustaffa Halabi Azahari

Abstract Photographic images found in magazines, newspapers, billboards, the Internet, and on buildings has triggered a huge phenomenon in all aspects of human life. Recognizing the importance of images to the community, a study was carried out to identify the functions of the crime image displayed in press. Crime images are often displayed in the newspaper and become an obligation to be showcased to the public. The images provide a visual representation of the actual design to the community to be used as well as to be enlightened. However, whether it is capable of delivering positive impacts or otherwise to newspaper readers is questionable; thus, it became the main objective in this study. Three major Malay newspapers were selected: *Berita Harian*, *Utusan Malaysia*, and *Harian Metro* with violent crime pictures taken from the year 2007 to 2010. Two research approaches were employed through distribution of questionnaire and interview sessions. From 700 surveys distributed, only 404 surveys were answered. The results gained through the conducted questionnaire and interviews show that the crime image displayed in newspaper could provide positive impact on the reader. Although there are a few who mentioned that it can give a negative impact and cause trauma to the reader, it does not represent the majority of the respondents. In summary, the collaboration between the editor and the photographer in the selection of crime images in the press is of utmost importance. Positive impact of this study has proven that the effort by the newspaper media in the social obligation to the community has been successful due to their self-consciousness when viewing such images. This study also proves that the image is one of the most effective medium in conveying message and information to the general public.

Keywords Photographic • Mainstream • Image • Newspaper • Crime

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50.1 Introduction

The importance of learning photography is not just centered on know-how of the camera's technical functions, but it is more to understanding and appreciating the art of photography itself. Hence, this study focuses on the function and importance of crime image photography with selective images in newspaper as subject matter of the study. Image photography in newspaper plays its role in diverting people's attention toward its respective, intended issue. For that reason, photography images are the vital part of a newspaper in which photography exploit its and Ingledew [1] believe that photography has a "power to evoke, inform and inspire each individual" (p. 12). Newspaper and society can be closely related to each other. In a situation where there would be no newspaper in existence, it will affect the society greatly especially in learning or attaining the latest news. Vice versa, this goes without saying to the presence of newspaper but without the society as its readers which will ultimately render the newspaper to disappear completely as it lost its main purpose [2–4].

Newspaper readers or followers are the ones who made this reading material as their main source of current news or info Reah [5]. Newspapers, as we know it, serve as a platform to the community in obtaining information of any news around the world. Newspapers befit a medium to report news and information about what happened in our daily lives locally and the world. Additionally, newspaper exists to impart the right information to the people, and it becomes a tool of communication to the society. This study, therefore, is to uncover in what way crime images from Mainstream Malaysian Newspapers affect the society. The outcome of this research will benefit the students, society, and media publication especially the newspaper. In this research study, the three Mainstream newspapers *Berita Harian*, *Utusan Malaysia*, and *Harian Metro* are selected to become as major references for the study [6].

The purpose of this study is to study or unearth the impact of crime images to the society. There are two objectives to be achieved in this study. The first objective is to study the perception of the readers of the newspaper toward the effectiveness and impact of the crime pictures displayed on the mainstream newspaper. The second objective is to study the perception of the readers toward their level of understanding and awareness of the message of the crime images. Photography has a very strong influence on the current society. This is proven when this medium has become a necessity in society nowadays. Novitz [7] substantiated that the photographic image has become an important medium of communication in the world today. Mustaffa Halabi [8] also expressed his views on this issue where the use of the photographic image is not only meant for family and as a hobby to record personal activities, but it contributes a great deal to social development, economics, politics, psychology, and even education. The Internet is vast with thousands of photos uploaded on a daily basis, and this is enough to prove that this medium is very popular among members of the community throughout the world [9].

Every creation of images has its own intended messages. Even if it is created for personal purposes, it still carries thousands of individual values. Understanding images that serve bigger connotations proves that it empowers the society's life. Images play an important role in delivering messages to the public, and its impacts are able to impart its message efficiently without the need to explain further as images can do the task of clarifying the information as well as influencing the readers' emotion [10]. Images are exceptional in empowering people's emotion and capable in delivering intended message commendably without resorting to the utilization of somewhat high-end vocabulary to describe a situation clearly [11]. Countless views born from photography images are gathered from published media or acknowledged from opinions from others. Rivers and Mathew [12] also inspire images as a part of valuable power to create world vision in the mind of the viewers. They depict photography image as more proficient than paintings where the images captured by the photographer are natural, easy to understand, and authentic [12]. The credibility of an image shows its various interpretations, and no wonder that Harris [13] stressed that images can be read and translated into different meanings, and usually it derived thousands of interpretations and views in accordance to the viewer's experience [14].

A picture can paint a thousand words and create different perceptions. This is the strength of an image or picture where it can be used variedly and for any areas. Accurate selection of images should be done before it can be displayed or printed for the purpose of having to meet its intended objectives for the readers' perusal. In news or advertisements, images have to undergo several phases of consideration before reaching the final selection. This is to ensure it fulfills its designated aims, retaining its aesthetic value, and to ensure that it does carry the intended messages, and the final reasoning is it can aid in beautifying the established designs within the newspaper [10].

50.2 Research Methods

The method used in this research is quantitative. These kinds of methods are utilized solely for the purpose of obtaining maximum information to assist a research. According to Sulaiman Shamsuri [15], quantitative research refers to countable items, while qualitative method is for a study that relates to the quality of items that cannot be measured statistically. To determine the perception of crime images on readers, quantitative assessment approach was administered in which the end result of the study is divided into total number of respondents who agree and disagree. Quantitative method also was used to measure public's perception on crime images.

This research uses images obtained from the newspapers as part of the study. The main medium is the crime images published in the Malay-language newspaper in Malaysia, and these images can assist the evaluation of identifying the impact of crime images to the readers. There are three types of major Malay-language newspapers which are used in this study, namely, *The Star*, *Utusan Malaysia*, and

Metro Newspapers. These three types of newspapers have received the highest readership statistics according to the resources obtained from the analysis conducted by the Media Specialist Association (MSA) from 1988 to 2008.

After opting for major Malay newspapers, crime images are distinguished for the study. There are various criteria to be considered in the crime images selection process. The first criterion is that the selected image must be based on violent crimes such as snatch theft, murder, kidnapping, and abandoned baby cases. The second criterion is that the image must exude the actual crime situation. Among other factors that led to the selection of photographs include any crime-related news that caught the attention of the members of the community. Limitations had been set on the selection of crime images by considering images published from 2007 until 2010. This is due to the never-ending occurrence of violent crime in the society and still continues even now.

Questionnaires will be administered and then distributed to target newspaper readers and students. Abraham [16] had mentioned that a questionnaire is not merely a tool for respondents to fill in the blanks of every question but as an effective tool in the form of obtaining data quantitatively. The Department of Health and Human Services Centers for Disease Control and Prevention has stated that the instrument of questionnaire is utilized when there are limited resources for the study and more data are needed from different parties. Questionnaire is also applied to attain and gather knowledge-based information, beliefs, attitudes, and behavior and to protect the respondents' privacy. Correspondingly, this medium is chosen to collect information related to the effectiveness of crime image on readers.

The questionnaire's items are designed in accordance with the research objectives. Each target respondent needs to answer four parts in the questionnaire. Part A centers on demographics; the focus of this section is to obtain respondent's personal information. The result of this section will be analyzed with the rest of the questions to produce a sound and strong conclusion. Next, Part B is designed in yes or no items to measure public awareness of crime in Malaysia. This is to cater the question of measuring the extent of the society's knowledge of crime occurrences in Malaysia. Furthermore, this section commences the flow of this study toward accumulating possible complex answers to meet the research objectives. In section C, 13 violent crime images are prepared from newspaper cuttings in the questionnaire. Before answering the questions in this section, the respondents view and examine the displayed images in their own time, and the questions that follow are based on their feelings the moment after observing the respective crime images. This section aims to evaluate the effectiveness of crime images in conveying its message to the newspaper readers and the society. The items provided in the questionnaire are in Likert scale of 1 to 5 using strongly disagree, disagree, neutral, agree, and strongly agree as its measurement. Pallant [17] stated that the Likert scale items are the form of responses that can help attain bigger score and avoid bias answers. Part D is the last part of the survey questions that associate respondents' assessment of criminal images displayed in the Malay newspaper. This section also contains questions which enable the respondent to choose certain criteria of images that suit their needs. This question emphasized on different selection of criterion of crime image that is permissible to be viewed by the society or the general reader.

Each designated question needs to be confirmed by experts to determine whether they are fit for use before they are distributed to the respondents. This is to identify potential weaknesses in the structure of the questions and to avoid mistakes. As the questionnaire items are self-designed, confirmation of the questions' validity is needed from experts in this field. Firstly, verification was obtained from Prof. Dr. Mustaffa Halabi who is an expert in photography to fortify the items in the questionnaire to be related to the content of the study. Upon his approval, experts in the field of statistics were sought to verify the structure of the questionnaire. The purpose of this verification is to validate that each designed item assesses different subject and to make sure that no question measures the same item. Dr. Shukri Kamarul, a lecturer from Unisza, is responsible for this cause as he is an instrument specialist in statistics. It is confirmed that the items in the questionnaire are approved and can be circulated to the respondents. In addition, Dr. Shukri Kamarul remarked that the next procedure is experimenting on the reliability of the survey questions using SPSS software specifically by utilizing Cronbach's alpha feature. This is a common procedure adopted by each researcher using questionnaire as their research instrument. Thus, a survey on 50 readers had been conducted to verify the reliability of questionnaire items. Cronbach's alpha is tested as this coefficient in the SPSS software is used to determine the reliability of the items constructed in the questionnaire.

According to Pallant [17] and DeVellis [18], the appropriate coefficient of reliability should exceed 0.70. The reliability test had been completed twice to certify the practicality of the questionnaire. This is due to the result of the first test that failed to meet the standards of Cronbach's alpha value. In the first reliability test, it was found that the Cronbach's alpha value was below 0.70. The value obtained was 0.668 as shown in Table 50.1. Several causes of not meeting the required level of Cronbach's alpha had been identified. Firstly, it was found that the respondents cannot understand the questions as it can be derived that the language used is probably too complex. The next factors Likert scale were not employed in the survey. Hence, the outcome of the questionnaire is that the respondents gave inconsistent and bias answers.

After making some corrections and adjustments to the framework of the survey questions, the reliability test was administered for the second time. The result of the test is shown in Table 50.2 in which the Cronbach's alpha value is recorded at 0.711. This indicates that all items in the questionnaire are standardized and reliable.

Based on the identified research problems, a target population is chosen to complete the questionnaire and interview session. Sulaiman Shamsuri [15] articulated

Table 50.1 Cronbach's alpha values of first reliability test

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
0.668	0.661	21

Table 50.2 Cronbach's alpha values of second reliability test

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
0.711	0.663	32

that a population refers to any selected group that will fulfill the needs of research instrument employed in the respective study. Thus, Terengganu is selected as the setting to explore the impact of crime images to readers.

Terengganu is one of the East Coast states and has seven districts: Besut, Dungun, Kemaman, Kuala Terengganu, Marang, Hulu Terengganu, and Setiu. The total population in this state is approximately 1,035,977 million people [19]. Given the large population of the state, only one district, Kuala Terengganu, has been chosen as the sample population. Accordingly, the selection of this district is based on several factors. The first factor is that this district has the highest population distribution of 343.284 people.

The second factor is Kuala Terengganu has been recorded to attain highest number of violent crime of 218 total cases; 126 the number of completed case, while the total of 112 arrested cases recorded in 2010 [19]. It has been reported by the Department of Criminal Investigation Branch of Kuala Terengganu that violent crime cases is increasing from year 2007 to 2010.

50.3 Analysis Questionnaire

Questions in section C were one of the evaluations of the effectiveness and impact of crime pictures displayed on newspaper to the readers. Respondents were given several images of crime derived from three Malay-language newspapers: *Harian Metro*, *Utusan Malaysia*, and *Berita Harian*. Selected pictures were included in violent crime cases which have been published in press. Respondents were given time to look at and evaluate the pictures provided, and they were required to answer this question. Such answers will measure the effectiveness of crime images displayed. Fear of crime when viewing an image displayed was found in the majority of respondents that strongly agreed. However, only one respondent who strongly disagree, while another 17 people ranked on a scale of do not agree. Figure 50.1 shows a scale of respondent's level of fear when viewing crime images during the questionnaire session. The interesting fact about the findings is that out of the four hundred and forty-four people, there is only one respondent who strongly disagree (scale of 1), while seventeen others disagree (scale of 2). On the scale of 3 which refers to being neutral, it records eighty-seven respondents. A total of 142 people agree by choosing the scale of 4. Last but not least is the scale of 5, where a total of

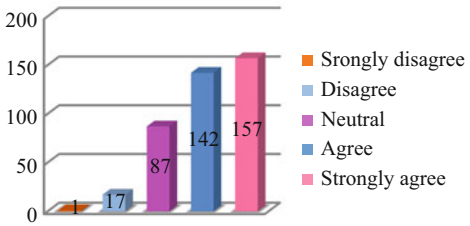

Fig. 50.1 Scale of respondent's level of fear when viewing crime images during the questionnaire session

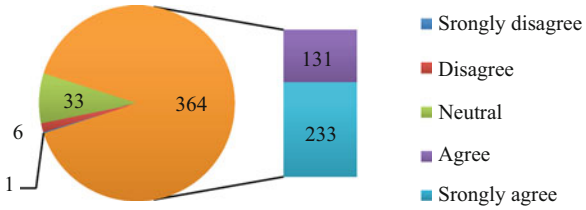

Fig. 50.2 Scale of respondent's anger experience of fear when viewing crime images during the questionnaire session

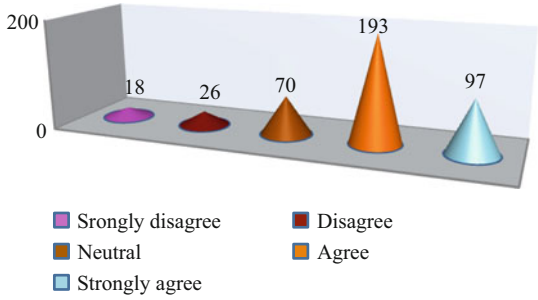

Fig. 50.3 Scale of respondent's level of positive impacts derived from crime images published in the press during the questionnaire session

157 respondents selected strongly agree in terms of how they have felt the fear of violent crime when viewing an image that is displayed.

The next question is to assess anger experience after seeing the crime images. By displaying a picture, it can change one's mood, and that is where this sentiment is measured in order to verify whether pictures are effective in conveying the message. Figure 50.2 shows a total of 133 people that said they strongly agree that they felt such anger. This follows by those who "agree" of 131 people. On a scale of 3, only 33 respondents are neutral. Six of the respondents stated they "disagree," and "strongly disagree" was stated by only one person.

This question aimed to identify positive impacts derived from crime images published in the press. Based on Fig. 50.3, it shows most respondents stated that the there might be an impact and a positive message to the displayed images. On a scale of 5, a total of 97 people was recorded, while on a scale of 4 a total of 193 was recorded. Neutral respondents were seventy. The remainder of the 26 respondents chose a scale of 2, and eighteen others selected a scale of 1. Despite the fact that the respondents do not experience feeling of sadness after viewing crime images, the statistics obtained are in favor of positive impact due to the majority of the respondents have chosen a scale 3 to scale 5 compared to scale 1 and 2. Have we ever thought about the impact of the portrayal of crime pictures emblazoned in the press? Will it be able to give a positive message to the reader? The meaning of a positive message in this situation was whether the image was able to bring awareness to the reader as well as educate them. Responses from readers provide a relief to please all parties, including the crew of the newspapers. This was because the majority of readers agreed saying that the image of crime is likely to provide a positive message to them. This finding demonstrates the crime pictures shown to the reader are not misguided. These findings could also serve as a proof that the crime images displayed in the quality press because it can have a positive impact on the reader.

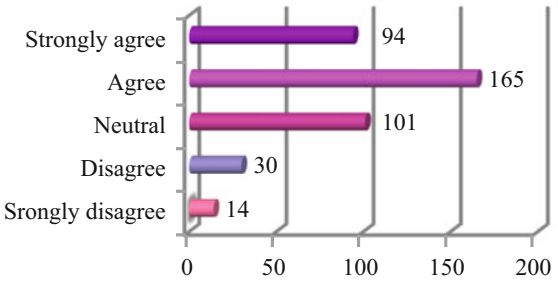

Fig. 50.4 Scale of respondent's identify whether the image displayed in the daily newspapers has a positive or negative impact

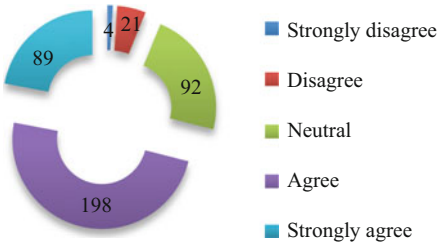

Fig. 50.5 Scale of respondent's level on images displayed that convey the message effectively to readers

To identify whether the image displayed in the daily newspapers has a positive or negative impact, readerships' opinion were taken into consideration. Newspaper readers have the right to make their judgments. Figure 50.4 shows the findings on this question. There are fourteen respondents who chose "strongly disagree" and thirty respondents who chose "disagree." This indicates that respondents do not agree that the picture displayed in the daily crime can convey a positive message but can relay negative impact on them. Neutral scale was picked by one hundred and one respondents, followed by a scale of 4, which recorded the highest number of one hundred and sixty-five. Last but not least is the scale of 5 that recorded a total of ninety-four. The results obtained showed that the image displayed more positive impact, and it has been proven by the results obtained, and it was illustrated in Fig. 50.4. Certainly, portrayal of crime image will have a positive effect and a negative effect on the readers. Whether they get a positive impact or vice versa, it all depends on the readers because they have seen and assessed the images. The definite answer is sought on whether the displayed image in many newspapers provides positive than negative impact on readers or otherwise. It turned out that the answer showed that respondents felt crime image gave a negative impact on them. This statement was proven when 44 respondents disagreed with this statement.

They do not agree that they see images of crime could provide a positive impact on them, but they see this image portrayal will give negative message to them. The negative impacts include possible situations that will make the reader be tempted to do the same thing when looking at images of the crime.

Each image displayed in the newspapers carries a huge responsibility on giving instruction, warning, and disseminating current issues to the reader. But to what degree do images displayed convey the message effectively to the reader? Figure 50.5 answered this question. One hundred and ninety-eight respondents chose a scale of

4, which they "agree" that the image displayed convey such messages, and this is the highest number recorded. The scale of 5 showed a total of eighty-nine people and was followed by a scale of three, ninety-two people. There are twenty-one respondents who chose a scale of 2 and four respondents who chose a scale of 1, "strongly disagree." Photographic images have a profound effect on society. On that basis, every report of crime news is accompanied by images, which aims to strengthen and maximize the delivery of the news to the reader. The functions and the roles of the crime images are very significant and have always been a newspaper reader's main attention. However, does crime pictures featured in major Malay newspapers convey the message effectively? Evidence from the distribution of the questionnaire gave a definitive answer, and it will be explained in detail and supported with facts from books and other materials. There were four people who chose a scale of 1 and 21 people who chose a scale of 2 where they do not agree that the images of a crime that they see are able to convey the message effectively. Even so, it did not become a big issue because the majority of readers agreed with this statement. The majority of readers can understand the message that is trying to convey through the crime images, and the image's function was effective in achieving its objectives. Therefore, it was clear from the answers given by the respondents that an image is capable of carrying out its functions to deliver the message effectively to its audience. Facts supported from Borchers [20] also reinforced this research where he argued that the image is a visual form of communication that can convey the message effectively to the audience. So not surprisingly, the uses of images in news reports of crime are able to be understood by the reader.

50.4 Important Analysis and Findings

This study has reached the final stage which is the comprehensive summary of the research findings. During the course of this study, there are many interesting inputs that serve as a reference for future researches as well as to improve any weaknesses and deficiencies which existed in the current study. Photography image is an invaluable asset that contributed significantly to the society and the world. In general, this technology is said to be beneficial rather than detrimental to newspaper publishing industry albeit originated from technological advances that associated with negative impact. This is evidenced in every printed news material where photographic images dominated almost in every issue. Image is argued to be an authoritative element in relaying a message more effective than having a thousand words illustrating the same issue; furthermore, this has been proved over the years through researches conducted by experts and substantiated more in this study.

The research findings have verified the capabilities of image in its role of conveying information directly to the community and the general reader. This statement is based on the analysis of the distributed questionnaires which classify the perceptions of readers on the role of crime images displayed in the local Malay-language newspapers. It is undeniable that naturally readers can comprehend the message

depicted in the images. Differences in age, educational level, and personal preferences of newspapers to read are not an obstacle for the reader to understand the implied message of the crime images. Readers can easily understand the picture shown in the press as it has up-front nature and direct message. Though readers have diverse and distinct perceptions and opinions from one to another, they still regard crime images as an influential and important aspect in reading a newspaper. Hence, it is not surprising that photographic image is a drive factor for readers to buy a newspaper.

The result of the questionnaires also illustrated that Metro newspaper has received the highest number of readers compared to *Berita Harian* and *Utusan Malaysia*. The researcher has utilized interview as part of the research instrument to determine the source of a newspaper's readership. Therefore, based on the interview session with the *Harian Metro's* editor, it was found that the press adopts an approach to gain readers' attention by highlighting domestic current issues such as incest, rape, child abandonment, robbery, burglary, drug abuse, and violent crime issues. These issues are regarded as more personal to the readers as they are more concerned of their safety and their families. The disclosure made by *Harian Metro* editor has been very useful information to these readers. Apart from being enlightened with current issues, readers can prepare themselves with precautions in ensuring the safety of their loved ones and themselves so that they will not end up as another victim in such crime.

News associated with crime is also a focal reading point, which clearly emphasizes that this type of news is appealing to the community especially the readers. Curiosity arises when dealing with crime-related issues. This is because the reader feels intimidated with current criminal issues that caused the reader to be attentive with the developments of domestic happenings that have connection with crime. In the early part of this research, three major local newspapers in Malay language were listed which will contribute to cater the scope of this research. These selected newspapers are Malay-language newspapers that attained the highest ranking based on the reader's choice, namely, *Harian Metro*, *Utusan Malaysia*, and *Berita Harian.* These three newspapers also have been publishing extreme or graphic crime images. Based on what factors does a certain crime image classified as extreme and graphic? An interview session with the editors and the newspaper photographer explained to what degree does a crime image is considered as an extreme. The criteria of an extreme crime image are: (1) the angle taken that shows the whole crime scene and possibly the real situation of the scene; (2) it shows the alarming condition of the frightened victim, but the victim's face is concealed through different camera angles or edited through the use of censor; and (3) the images are startling or explicit, but do not reveal the identity of the victims. These criteria are the main indicators of extreme pictures in a newspaper. Nevertheless, it was found that Malay-language newspapers still maintain its sensitivity over the crime images in which they would not publish the victims' face; extreme images shown serve the purpose of creating an awareness and not surpassing the ethical boundaries of journalism. In addition, the interviewed editors and photographers have further claimed that only local, non-Malay-language newspaper, namely, *Nan Yang Siang Pau*, displays tragic and brutal

crime images excessively. Pictures of victims in horrible condition such as decapitated limbs will be displayed without any censorship editing. This is an unethical occurrence, and such release humiliates the victim's family members, and it should be noted that to date, the Malay-language newspapers still uphold the humanitarian value of respect in publishing the crime images to public.

Having similar objective, namely, to deliver messages and warn the readers but at the same time respecting the values and ethics of journalism. This is one of the pro of Malay-language newspaper. Newspaper publishing world has enlightened the duties and responsibilities undertaken by the media. Each press strives for different merit and management flow, respectively, as it is being governed by their own company proprietors. However, these differences will equate when dealing with similar current happenings, particularly crime incidents that take place in Malaysia. For newspapers, the escalating crime issues are treated as a medium to disseminate news and information to the community. The purpose and function are the same, to provide fast information to the reader, present the latest news about current happening, and thus help the authorities to prevent the increment of criminal activities that threaten the readers and the community at large. It is most useful and fascinating to achieve the main objective of the research which is to identify the impact of crime on readers. The research findings supported by a majority of newspaper readers prove that by displaying crime image in the press, it has managed to drive the reader toward a more positive mindset. It can be concluded that the news media have also achieved their main objective which is to create an awareness of current issues to the reader via crime images. Although some are displayed in a rather extreme state, it does not prevent the reader to understand the intended message. The readers nowadays are good in analyzing and making the right judgment. These also establish the strength of the role of image as a medium to convey the message effectively.

The main objectives of the research have been achieved and thus provide a very encouraging outcome for this study. The research objective has been fulfilled in which the aim was to study the impact crime images in relaying its intended message to the reader. It was confirmed that the published crime images in the printed media have positive impact on the reader. But in what sense do the crime images project such positive impact to readership? Image is a form of visual communication that is acknowledged by all levels of society. Individual differences in terms of language and culture are never an obstacle to comprehend intended message of a crime image. The moment that the readers perceive the target image is an invaluable experience. This is where the readers might be provoked to interact within self; analyzing the image and the subject of the image will bring about a different situation. In this different situation, the readers will put themselves in two positions as criminals and as victims. When the readers put themselves in the criminal's viewpoint, readers will feel remorse, overcome with sadness in realizing that they can stop themselves from committing such crime. However, through the victim's point of view, readers might relate with the victim's plight and experience the feeling of being abused and in denial. These circumstances will lead the reader to come up with alternative ways to distance and protect themselves from becoming the next victims of such heinous crimes. Such is the strength of the image; an image alone

can incite various understanding in depicting the message effectively. There is no need for long text to persuade and enlighten readers about the dangers of criminal act. In conclusion, an image can elicit strong sentiments ranging from anger and remorse to sympathy and sadness, and all these feelings combined give a strong impact on readers.

To conclude, displaying crime images in newspapers is an indispensable function as it has been verified that it is beneficial to all members of society. Relying solely on text in a newspaper does not serve the purpose of meeting the target objective of the news which is to inform or alert the readers. But through the use of images, the message will certainly be delivered effectively and the news' respective objectives will be met. The press is encouraged to utilize images as it is an effective medium in highlighting an issue, and consecutively, it contributes to heighten the sales profit of the printed media.

50.5 Recommendations

In terms of suggestion for improvement, there are some significant recommendations that are pertinent to this study. First and foremost, selection of potential images to be displayed in the crime news section should consider the probable cause and effect, in which the final decision on choosing the crime images must be based on the objective of disseminating information and creating awareness to the reader and is not purely intended to maximize sale profits alone. Next, publication of extreme images is discouraged to protect the victim's dignity and sensitivity and prevent traumatic experience to the readers. In addition, newspaper readers should be exposed to the measures to evaluate a crime image. This is important for readers to learn how to judge a picture so that the intended message can be delivered effectively. The next recommendation is that the newspaper publishers should ensure the standards for printing quality of the displayed images. The degree of printing quality can be improved as readers can criticize and help in improving the existing quality. Ignorance on such matter will dissuade the readers to view the images. Furthermore, images displayed in the newspapers are significant to the reader; thus, it is vital for the published images to cater the readers' diverse needs in color, size, and interesting angles. Readers should be given the opportunity to assess their level of satisfaction on the use of the crime images in the newspaper, hence, to identify the strengths and weaknesses. Thus, maximum use of text and utilizing good quality images can help in conveying the message effectively. Next, newspaper companies need to defend the truth and be just to the degree that they must display crime news directly and with no malice. Therefore, the responsibility to educate the reader to the interests of images needs to be emphasized. After acknowledging countless efforts made by the media to report crime occurrences, it is deemed imperative for every member of society who are also the readers to review the intended message thoroughly, thus fulfilling the intended objective of the respective news of criminal acts.

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Chapter 51
Classification of Frieze Patterns in Malay Songket Textile

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Abstracts In Malaysia, songket is the most popular hand-woven fabric and is classified as an antique craft. The authentic songket is woven by the Malays especially in the East Coast of Malaysia such as Terengganu and Kelantan. This paper is about the analysis of Malay songket patterns with the use of the method of 2D plane which is frieze patterns (border patterns). This paper is based on the classification of Malaysian songket patterns especially on border patterns (tepi kain, kaki kain, and kepala kain) which are from kain sarung and kain lepas/selendang (shawl), and these are based on their geometric symmetries on the plane. It constitutes an extremely valuable tool for this paper because it enables the characterization of songket patterns into frieze patterns. The benefit of this paper is to be documented and catalogued as useful guidelines for related professions and as database for future reference. It also served as evidence of the existence of geometric and symmetry patterns on Malaysian songket patterns as a useful contribution to the songket design industry and finally to be an example for other Malaysian arts or crafts for making ideas and design in an effective way.

Keywords Songket • Mathematical pattern • Frieze pattern • Symmetry • Geometry patterns • Euclidean transformation

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51.1 Introduction

Varieties of fabric had contributed to the development of textile industries simultaneously and the liveliness of various fabrics where patterns in weaving take place in this world. In Malaysia, the main and popular traditional textile is the kain songket [1]. Most of the Malays called it "kain songket" and kain which refers to the cloth or woven material. The word "kain" also means the sarong, where the Malays used to wear it as clothing during daily or ceremonial occasions such as kain sarung with baju kurung or kebaya [2]. Kain songket is actually in the olden days and was only for the royalties and people of the palace. One of the weaves is often woven to the imperial family called the "tenunan songket benang emas" and "kain limar bersongket." But nowadays the kain songket is being worn from the ordinary people to the royalties. The songket is expensive, and therefore only rich people could afford them. The best quality in Malay weaving fabrics comes from Kelantan, Terengganu, and Pahang. The techniques and motifs of the Malay weaving could be from the influence of China, Cambodia, India, and Arabia. This condition may be also influenced toward the development of songket weaving in the East Coast of Malaysia. However, this paper only concentrates on the pattern of the traditional sarong songket and to find out the classification of frieze pattern in the songket textile design [3–6].

51.2 Songket

Songket weaving is an extra weft weave where gold threads are inserted into plain weave to create motifs and patterns on the woven fabric. The additional weft threads can be of gold, silver, and metallic-colored threads. In the songket process, there are about 11 steps. The processes of songket start with membasuh benang (clean the threads), mencelup warna pada benang (dyeing), menerai and menganin (warping), mengulung (roll the warps), menyampak (inserting warp through the reed), mengarat (making of shafts), meneguh (tension the warps), gigi belalang (making of tekat 3 or 5), menyungkit (uplifting warps for songket pattern), and menenun (weaving).

There are six basic textile patterns that have been used in creating the structure of songket patterns. The six basic textile patterns consist of full-patterned songket (corak bunga penuh), isolated pattern (songket bunga bertabur), stripe patterns (songket corak jalur berdiri and corak jalur melintang), zigzag pattern (songket corak siku keluang), checkers (songket tapak catur), and songket pucuk rebung. While the motif that is often used in songket weaving is sourced from plants, cosmos, earth, animals, and nature. The design is more focused on geometry, abstract, style, and realism. The structure of the songket fabrics is mainly in sarong and kain lepas (shawls). Therefore, the structure of sarong songket consists of "kepala kain," "badan kain," and "kaki kain" which include the "mengapit kepala kain" and the "kendik." The "kendik" is the smaller board pattern at the "pengapit kepala kain" or at the boarder of kaki kain sarong. The structure of kain songket lepas consists of punca kain, badan kain, and kaki kain.

Structure of Kain Sarong Songket

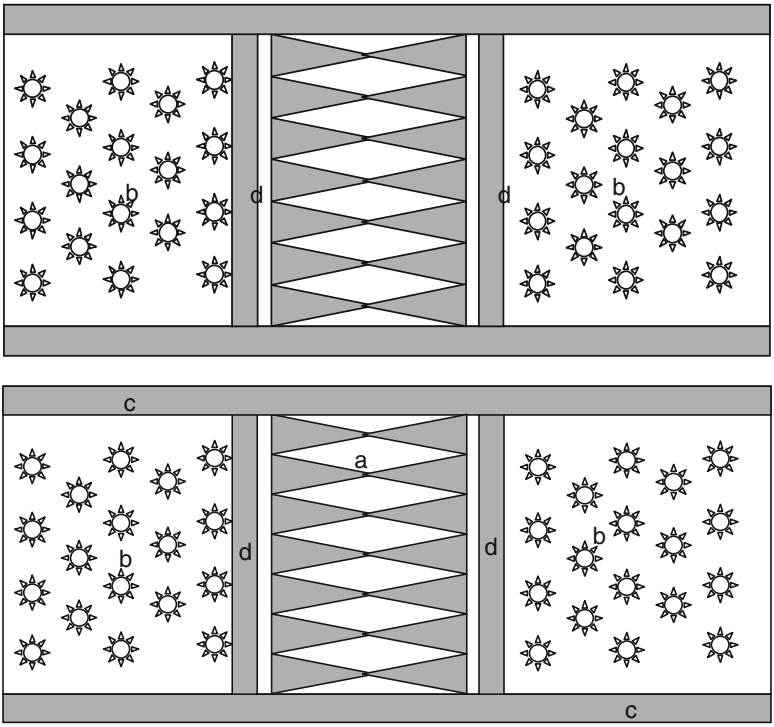

Fig. 51.1 (**a**) *Kepala kain*, (**b**) *badan kain,* (**c**) *kaki kain,* and (**d**) *pengapit kepala kain*

Structure of Kain Lepas Songket (Shawl)

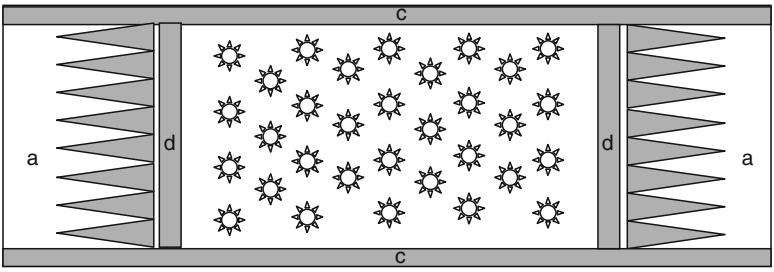

Fig. 51.2 (**a**) *Punca kain*, (**b**) *badan kain***,** (**c**) *kaki kain,* and (**d**) *pengapit badan kain*

51.3 Related Work

Most work related to classifying pattern in symmetry group is mainly aimed to study the geometric concepts of symmetry and pattern. In Djbril M.O. and Thani R.O.H, the authors propose a general computational model for extraction of the symmetry features of Islamic geometric patterns (IGP) images. In the paper of E. Rokiah (et al.), the authors discussed on the mathematical thinking of the weavers and the process of songket weaving. M.A. Hann, the author, writes on the classification and analysis of regular geometric patterns with particular reference to textiles. For this paper it is based on the traditional Malay songket patterns [7–8].

Geometry, Symmetry, and Frieze Patterns

Geometric motifs or patterns are a motif, pattern, or design depicting abstract, non-representational shapes such as lines, circles, ellipses, triangles, rectangles, and polygons. They are objects that are repeated in an order. While the meaning of symmetry is when one shape becomes exactly like another if we flip, slide, or turn it. In the simple words, symmetry is reflection or mirror. Symmetry is one of the elements in geometry. There are four ways of moving a motif to another position in the pattern or transformations or symmetry operations. The four ways are translation, reflection, rotation, and glide reflection.

A set of all rigid transformations which are symmetries of a pattern has a group structure. This is called the symmetry group of the pattern. Symmetry group consists of three types of periodic patterns which are based on 2D plane (frieze patterns and wallpaper patterns) and 3D plane (crystal patterns) [9–10].

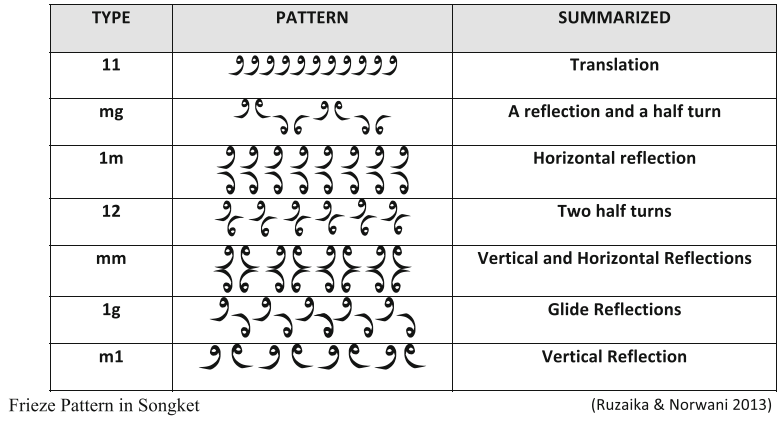

Fig. 51.3 Seven types of frieze patterns (Ruzaika and Norwani 2013)

A frieze pattern is an infinite strip with a repeating pattern, and it can also be called as border pattern. The term "frieze" is from architecture, where a frieze refers to a decorative carving or pattern that runs horizontally just below a roofline or ceiling. Frieze pattern consists of seven types, and one of these patterns can be found in the border pattern in songket. Before analyzing the pattern in songket, it is essential to understand the shape and terms of design in geometric concepts.

Frieze Pattern in Songket

A frieze is a pattern which repeats in one direction or a line of symmetry groups usually found in border or band patterns. Based on the symmetry properties, mathematical analyses reveal that there are seven different frieze patterns. In *songket al*most all the designs in the *punca kain*, *kepala kain*, *kaki kain*, *and pengapit kepala kain* consist of these frieze patterns with different arrangement of repeats. Frieze pattern can be seen in Fig. 51.1. We can analyze s*ongket* with frieze pattern in the figures below.

1. **Classification of frieze pattern that can be found in songket sarong of full-patterned songket (*songket bunga penuh*)**
   Example 1:

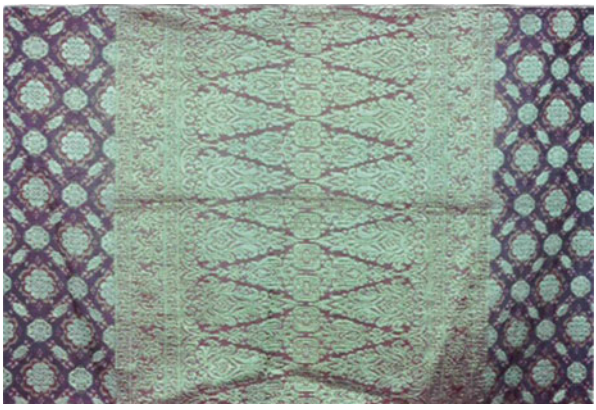

Fig. 51.4 *Sarong limar bersongket* with frieze pattern at the *kepala kain* and the *pengapit kepala kain* (panel of the sarong)

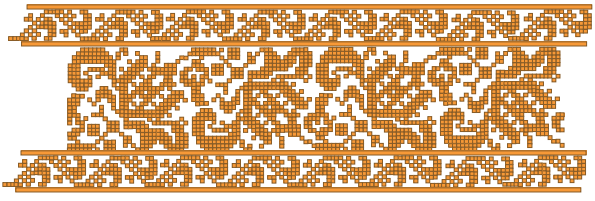

Fig. 51.5 The border pattern in the sarong is motif *bunga ati-ati* in ***glide reflection*** of frieze pattern

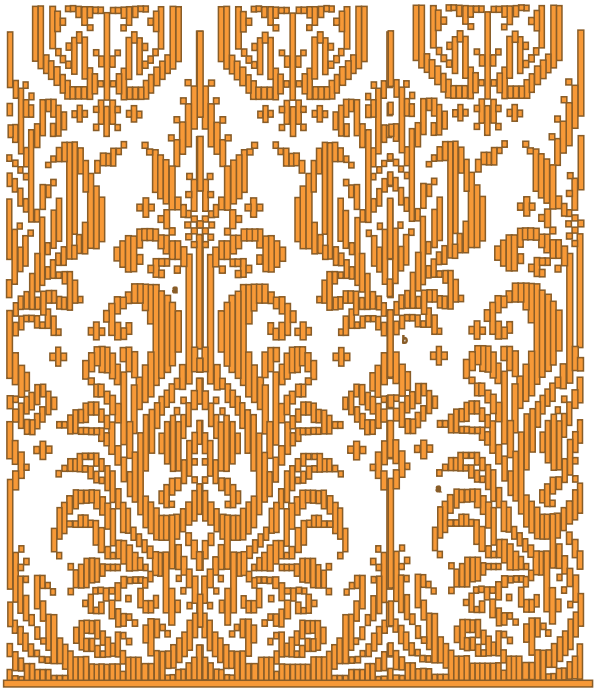

Fig. 51.6 The motif of *pucuk rebung lawi ayam* at the panel of the sarong *songket* shows that the motif is in symmetry and repeated constantly in ***translation type 11***

Example 2:

Fig. 51.7 Sarong of full-patterned songket

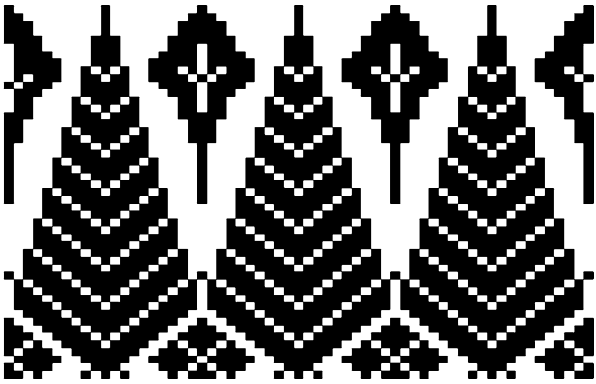

Fig. 51.8 This is another example of songket that shows ***translation*** of frieze pattern. The motifs are *pohon rhu*, *bunga tudung celak*, *and bunga pecah empat*, situated at the border pattern (*kaki kain)*

Fig. 51.9 This is also an example of *pucuk rebung lawi ayam* and *bunga bintang* at the kepala kain songket that shows **translation type 11**

2. **Classification of frieze pattern that can be found in *songket* sarong of stripe repeats (songket corak jalur berdiri and corak jalur melintang)**

Example 1:

Fig. 51.10 Songket with stripes repeat motifs of pucuk paku and isolated motifs of tampuk manggis and buah cermai and border pattern or *kaki kain* of *awan larat berjuang*

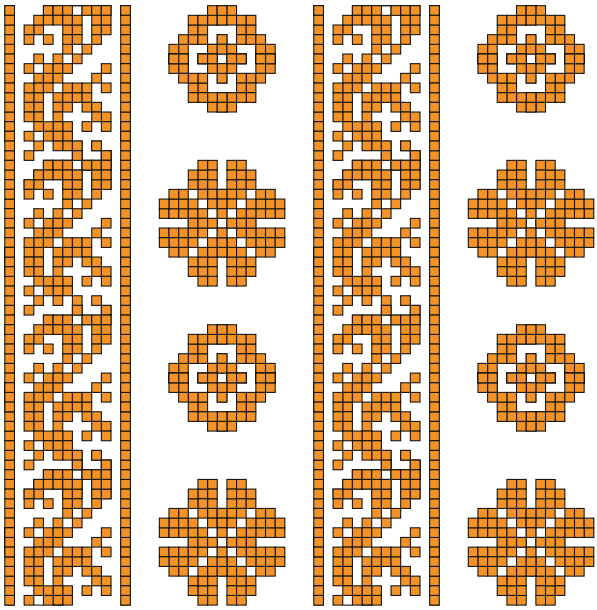

Fig. 51.11 The stripes *pucuk paku* in this songket pattern show ***the type 1 g-glide reflection*** in frieze pattern, and the other spot repeats of *bunga tampuk manggis* and *buah cermai* represent the ***type 11 translation*** as it repeats constantly in vertical

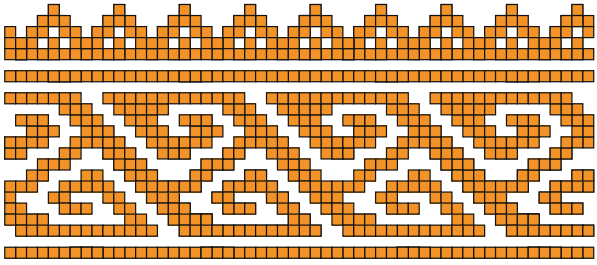

Fig. 51.12 The border pattern of *awan larat berjuang* refers to the ***type 11 translation*** as it repeats constantly in horizontal

Example 2:

Fig. 51.13 The *tengkolok* (head cloth) is shown here with stripe pattern on the *badan kain*

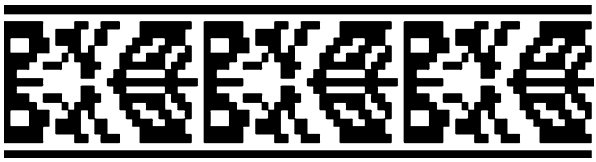

Fig. 51.14 Stripe pattern on the middle kain. Motif of leave and flower – **translation type 11**

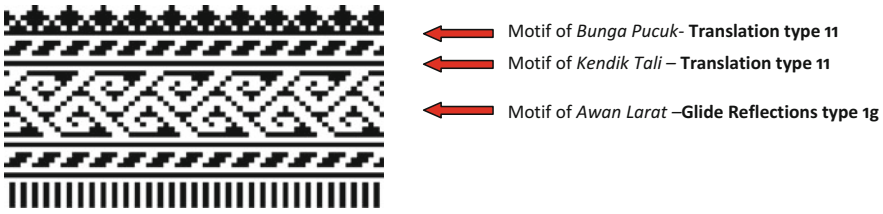

Fig. 51.15 Border pattern at the tengkolok with motifs repeats in glide reflections and translation type 11

51.4 Conclusion

Based on the analysis of songket patterns, most of the repetition of patterns in songket design especially on frieze patterns is in translation, reflection, and glide reflection. We can see the repetition of translation in Figs. 51.6, 51.7, 51.8, 51.9, 51.10, 51.11, 51.12, 51.13, 51.14, and 51.15. While the repetition of reflection and glide reflection is in Figs. 51.5, 51.11, and 51.15. The analyses of songket patterns had shown the existence of frieze patterns in the Malay traditional songket design. Therefore, the outcome of this paper is a mathematical classification (in terms of symmetry groups) of repeated patterns into finitely countable classes which is very few researchers had studied on the local textile especially in songket. Furthermore, the motifs of weaving songket are traditionally composed of geometric pattern, and the research on geometry of songket textiles is involved with the motif composition. Therefore, it is essential to fill the gap lacking in geometry and symmetry research particularly on the elements of songket pattern design.

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Chapter 52
Mengkuang Pattern of Plaiting as an Aesthetic Design in Kedah

Noor Hafiza Ismail, Norwani Md. Nawawi, Salina Abdul Manan, Azni Hanim Hamzah, and Nurul Izza Abd. Aziz

Abstract Plaiting started in the Neolithic age, but it keeps on evolving through time due to the constant demand and creativity. This research aims to recognize several traditional and latest modern pattern design in mengkuang (screw pine) plaiting in Kedah. This research has been carried out in Kedah state in Peninsular Malaysia where the activity of plaiting the mengkuang is still carried out. In order to obtain viable information, the researchers carried out interview sessions with people who are involved with the plaiting industry in Kedah and in some part Kuala Lumpur. The researchers have also gone into the villages to conduct interviews with the people who are still actively doing the plaiting, thus also having a firsthand experience of watching the plaiting process. From the research carried out, studies have found out that there are certain products of plaiting that can only be found in the Kedah state. These products have become the states' very own trademark in promoting their craft internationally.

Keywords Plaiting • Motif • Pattern • Products • Aesthetic

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52.1 Introduction

Malaysia is famous and truly rich with its own handicraft work of high aesthetic value. It is undeniably true because there are many foreign researchers that have come to Malaysia to do their research on the handicraft products of this country. The outcomes regarding handicrafts in Malaysia can be a very useful information and guideline for all the people especially Malaysians. The written or recorded facts also play its important role in preserving the ancestor's heritage. Without serious action, our future generation can no longer see and appreciate this beautiful heritage which comes from our very own ancestors for generations. This art is a heritage craft that needs to be supported not just for its aesthetic value but also for its substantial contribution for the socioeconomic development in the industry. It first started as a cottage industry, and these traditional art skills used a lot of forest materials which could be developed into a bigger industry. The art of traditional skills has grown into one of the art communities to help the villages improve family economic resources. Art is also identified as the unique culture of the Malay society. It also reflects the village community of creative thinkers in the production of design patterns using natural color [9].

The creation of pattern depends on the plaiting main ingredient, *mengkuang* leaves. In fact, through pattern, one can tell from which state a particular plait comes from. Early generation in Malay society was very innovative and creative in creating plait patterns. They were inspired by their surrounding that was so rich with elements of nature. As a result, if we take a look at the pattern, most of them are geometrical, organic, abstract, flora, and fauna [1].

Problem Statement

The life that is close to nature has transformed their thought into something useful, such as plaiting, and is an endless effort and spirit of our ancestors. This is the legacy that should be remembered; however, the lack of support from related authorities has impeded the progress of the existing art of plaiting to be at par with *batik*, *songket*, and other traditional handicrafts that change over time due to the volatile nature of local and international market demand. Traditional Malay handicraft should be publicized to the young generation as early as primary schools to educate them on our Malay heritage. Creating awareness among the new generation will ensure their understanding and appreciation of local traditional handicrafts [12]. This problem proved to be critical as the local plaiting art is moving toward extinction if there is no action taken to preserve it. Nori Abdullah (2006, http://ww1.utusan.com.my/utusan/info.asp?y=2006&dt=1201&pub=Utusan_Malaysia&sec=Keluarga&pg=ke_01.htm), as a *Pengerusi Yayasan Budi Penyayang Malaysia*, says that the government and non-governmental organizations (NGO) should play their role to preserve traditional art and craft by obtaining expertise services in various fields to educate new generations. If no action is taken, sooner or later local art and craft will be extinct from culture.

Aims and Objective

This research aims to recognize the pattern of plaiting as an aesthetic design in Kedah with three objectives to achieve. Firstly, to identify the traditional and latest patterns in *mengkuang* plaiting; secondly, to examine the different pattern in products design; and lastly, to study the inspiration of getting the *mengkuang* plaiting design.

52.2 Literature Review

Mengkuang consists of various species of plaiting leaves that can be found in Malaysia and other tropical climate countries like Indonesia, Thailand, and the Philippines. It is also found in Australia, New Zealand, Africa, India, Papua New Guinea, and the Pacific Island including Melanesia consisting of Micronesia and Polynesia [8]. The *mengkuang* has variable use from the root until its fruits in the food production and fiber in textiles [11]. The plants show shady foliage thick long bladelike leaves found within in their own surrounding. Some even grow to a medium height of the jungle trees. It consists of the trunk with branches and leave sears, supported by many other roots close to the main root to withstand the burden of the shady leaves and the fruit they bear (Fig. 52.1) [4].

Since *mengkuang* mostly spreads by water, that is the reason why it is found in wet damp places. In Malaysia *mengkuang* is of various types commonly known as *Pandanus atrocarpus* scientifically. *Mengkuang* in Malaysia and other parts of the world is of the same type. The difference is just the way it is used in producing craft products. Malaysian plaiters choose two types of *pandan* for their plaiting purpose,

Fig. 52.1 Mengkuang fruit is in *green color* if unripe

the *Mengkuang Kampung* and *Mengkuang India*, due to the quality large leaves that makes it easier to plait and produce quality products [15].

Design is something that is very broad to be discussed especially because it does not limit to a particular thing, yet it covers all things in this world, be it a natural thing or one that is created by man. This reflects that design is really closely related to human and the environment which could fulfill and complement the needs and desires of human beings who always seek for perfection. All observable things whether attractive or not are still classified as design. It is also needed in everyday life of human beings as an agent which could facilitate them in solving any particular problem besides giving them comfort and convenience. Design cannot move on its own without the help from other things such as motifs and patterns. Therefore, design is interdependent with things that surround it in making something that is useful to human beings. It could also benefit living things available in this world, be it animals or insects. Design has been identified as a two-way communication tool which serves as something that has the ability to know and assist human beings in every related problem. Design is also known as a tool or a composition which acts as a planning tool in a particular work of two- or three-dimensional shape. It is one of the elements that is formal in nature which will be applied in arts with the exploitation of space, colors, and values and accompanied by the elements which are parts of the element of design.

Culture is considered as a way of life of an ethnic group of people who formed a resolution of a regulation mean, while civilization can be divided into 4 main sources, namely, in terms of tools and equipment such as housing food and clothing. Second is how to acquire food and the economic system implemented. The equipment available to the community enables them to have better living than before. Family ties and those who were linked to the political organization of the group. Finally, language whether they use it orally or written [2].

The Malay art will not be intact without the adornment of motifs and designs that are appealing and unique on the surface of the *mengkuang* leaf plaitings. The traditional Malay motif is divided into two parts, namely, the decorative motif and the ending motif which function as the decoration for an object. The production of a motif also has everything to do with the influence, also the customs inherited from various groups and generations of Malays in specific [5]. Without this motif, the society will not know about the identity of a race and ethnicity. The race will get to be known through the uniqueness and the differences of motifs which show the value of mastery and expertise in producing fascinating and admirable art form. The decorations of motifs are also able to distinguish the forms of art available in every place, district, and state in Malaysia, other than being made as a trademark on an object and on the type of plaiting that is to be marketed.

The existence of a motif is shaped from the image repetitions and also noted from small designs. The shapes are structurally arranged, where they follow the sequence that has been decided until it forms a pattern [7]. The production of this motif is also linked to the arrangement aspect of an object, whereby it involves arranging both organic and geometric shapes. This motif arrangement which has been done in repetitions would naturally involve other elements available in the

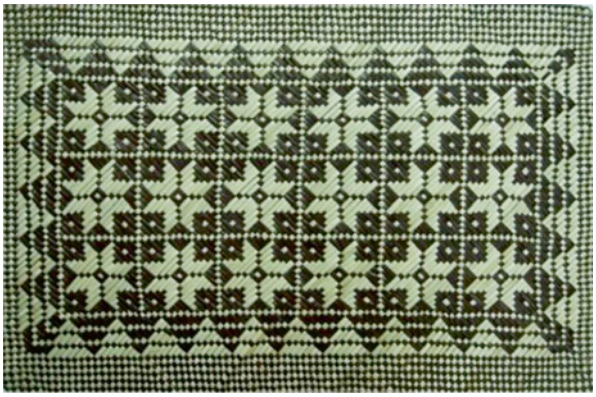

Fig. 52.2 The examples above are called all over design

design element like line, look, shape, value, and color [6]. The repetition will also produce a new design called *all over pattern* (Fig. 52.2).

Here, it can be seen that the motif cannot be separated from the presence of a design. The plaiting technique that has been developed will turn into various types of plaiting which produce motifs, and this plaiting comes in many colors. This is because the differences of colors used in the process of producing plaiting are able to show various types of motifs with assorted colors to be produced and shown to consumers [7]. It is stated that the motif is also classified as the theme, while pattern is visual elements arranged in such a manner that it covers the same area as that of the motif form. The most appropriate description for pattern is motif arrangements. When motifs are arranged in single unit repeats, it can be called as spot repeats. Motifs that are arranged in rows are called stripe repeats [14].

52.3 Data Collection and Methodology

Qualitative methodology is employed to produce a detailed and comprehensive study in order to obtain all the necessary information that can be utilized for accuracy of data analysis. Figure 52.3 shows the flow chart of the research methodology explaining on the steps used to collect the data (Fig. 52.3).

Research Design

The qualitative methods are used, and all information obtained is collected and recognized based on the research objectives. These methods are employed so that accurate information can be obtained and utilized. Consequently, the researchers

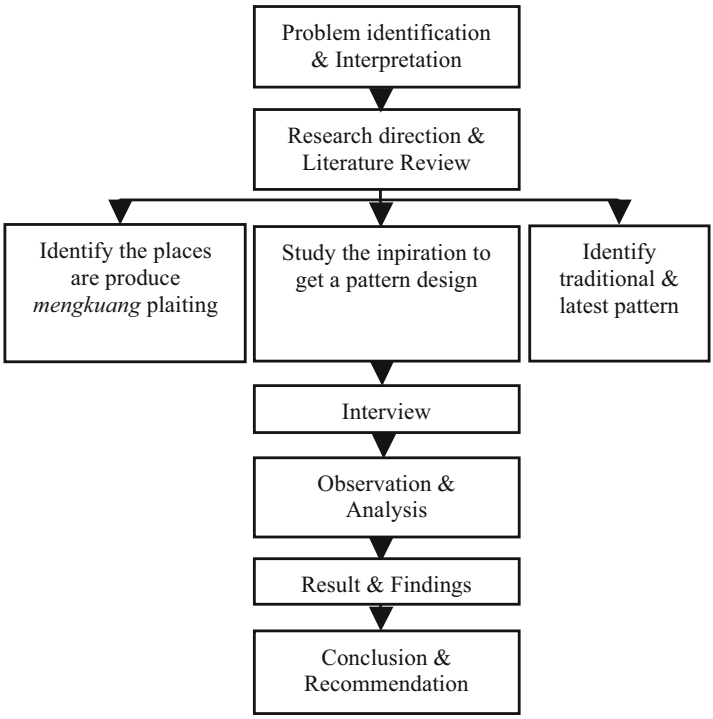

Fig. 52.3 Flow chart of the research methodology

will describe the various patterns of plaiting that are found as either the traditional or latest design. All stages in the research methods will be fulfilled in order to achieve the purpose of the study which is the aesthetic value of the pattern and product design. Exploration for each part is essential to produce a comprehensive study that can be used as a reference to all ages and specialization.

Experience Narrative

It's focusing on personal, several individuals or by grouping through their life context of a culture [3]. Life experience regarding *mengkuang* plaiting conveyed by both individuals and the community contributes to the data collection. The stories that are given can be a data which can be gathered through interviews or informal conversation. Through the process to get accurate data, the researchers will collaborate with the participants to check the story and interpret the meaning of certain data collected. Besides, the documents such as photographs and social artifact will be recorded as a proof.

Observation

This method refers to an empiric investigation that is able to impose the procedures of which effect to be discovered. The observations can be done in any method to allow fair attestation as possible giving the limitation method. The observation is one of designing that includes as a valid of view in terms of context under investigation as possible [7]. The observation is very important to researchers to find out about the traditional and latest pattern in *mengkuang* plaiting from Kedah.

Interview

Interview involves seeking information from the potential respondents by asking related questions about *mengkuang* plaiting to individuals involved directly and indirectly.

52.4 Result and Discussion

The expected outcomes of this research may prove to be a lot of benefit to the Kedah plaiters, craft center, and community especially. The finding of this research will be used as references to know the traditional and latest pattern in Kedah plaiting. Some of the traditional pattern from our ancestor was not used again. This knowledge is very important to a lot of people, for example, the foreign tourists who come and certainly want to know more clearly about types of plaiting produced. Therefore, all parties should play a greater role for the various types of plaiting that have not been produced yet and at present need to be expanded and reintroduced to the community in the effort to appreciate plaiting as one of the heritage traditions.

Plaiting can be in two dimensions or three dimensions where the two dimensions such as the mats for large living room, kitchen spread, sleeping mats, and mats for paddy drying purpose. The smallest is the 0.9 by 1.8 m prayer mats. 4×40 m is usually designed for the living room. The three-dimensional products such as the basket, sack, food covers, clothing containers, and race storage containers along with other plaiting boxes are available. Some even use the plaiting product for a religious ceremonial purpose with unique motifs. Traditionally communities are skilled plaiters when they fabricate their own daily use utensils [13]. However, sometimes plaiters easily get bored producing plaiting products such as mats, baskets, bags and hot for daily use when they have a large amount of raw materials to finish.

Traditional Motif

The production of the traditional motif on craft serves as an accessory or decoration which decorates the surface of craft products such as *mengkuang* leaf plaiting. The motif available on this plaiting makes it look more attractive and unique as a result of the creativity that has been translated on the plaiting. Old motifs are preserved as a symbol of a priceless heritage which needs to be protected from extinction. Without the presence of this old motif, new ones will not exist as continuity from the old one [15]. The use of traditional motif in Kedah has been identified as the motif of an elephant. This is based on interviews which have been conducted at villages that produce plaiting. A long time ago the elephant motif has been produced on storage containers which are usually used for daily activities. To expose the traditional motif, Siti Aishah Abd Rahman has produced mat plaiting using this elephant motif. The reintroduction of this motif is to compliment traditional plaiting motifs which are not recorded, as it would eventually cause extinction of the motifs which has been created by the previous generation. The production of this motif is also intended to bring back the glory days of plaiting creation which possess high aesthetic values to the present communities (Fig. 52.4) [10].

Traditional Pattern

Kedah plaiters also produce a variety of traditional state plaiting to retain the traditional pattern. However, the pattern of plaiting in Kedah is more for daily use goods compared to mat plaiting. The design of mat plaiting that uses the same design is found in Terengganu (Fig. 52.5).

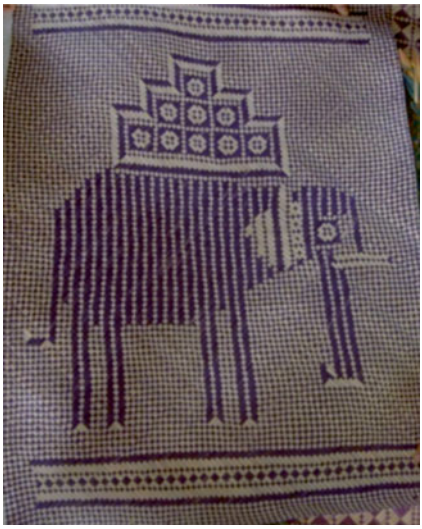

Fig. 52.4 Traditional pattern of elephant with a few motifs to make the beautiful mat

Fig. 52.5 The *left photo* is the example of twill plait, and the *right photo* is anyaman jawi (jawi plait) is known as by plaiter in Kedah

Fig. 52.6 The section of the basket lip known as frame in Kedah and the photos show example designs which divide that plait to become two layers

The above photo shows and epitomizes the traditional design in Kedah which uses a two-line technique in the former plaiting that was produced by Siti Aishah Abd Rahman. The pattern that forms the line becomes a trademark to all product items that produced not just in the former only; in fact it is also used in handbag and hand phone bag. However, ordinary pattern design depends on the creativity of plaiters in generating various designs that can be attractive to customers (Fig. 52.6).

The next photo is a reflection basket design produced in Kedah that uses the *motif kelarai tegak*. That basket uses ordinary design plaiting in the mouth surface and vertical twill motif in the part of the body until it basket. Usage of various plaiting techniques can produce design diversity on some plaitings. It also makes that plaiting to be more attractive and perfect goods (Fig. 52.7).

Fig. 52.7 Example of twill plait that generated a basket that is using vertical twill motif

Fig. 52.8 Example of patterned plait produced by plaiters in Kedah

Latest Motif

For a normal plaiting, they do experience changes in terms of the use of color on the blade of each material in which they previously use only one color. Now they are modified to have a plaiting that has various tones, and there are cases where the plaiting produced has a harmonious combination of multiple colors. Besides that, in terms of the design for normal plaiting, it also demonstrates a change in terms of the formation of various patterns suitable with the demand from consumers in the market. Now, we can see that there are various types of new design produced according to the creativity of the plaiters (Fig. 52.8).

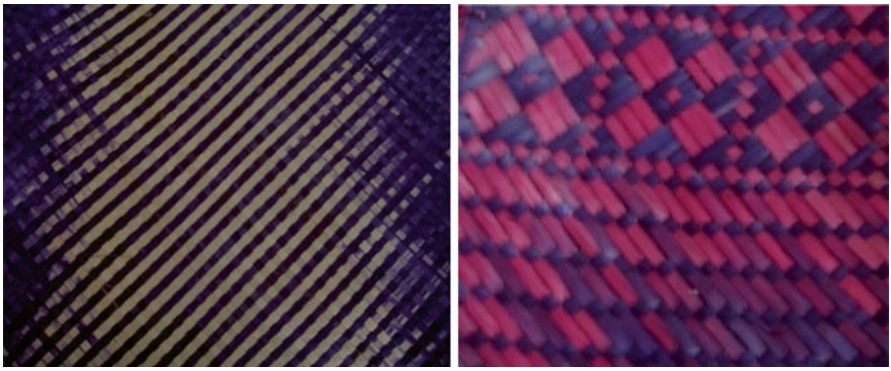

Fig. 52.9 Example of plaiting which uses tone color

The real thing, it is no more than just normal plaiting which does not has motif, but the result of alternating and repeating sequence of plait produced is making as if it is having a motif. This showed that the creativity of the plaiters can produce a perfect plaiting to the extent that the people viewed it as having motifs.

Latest Pattern

The figures below show tone color plaiting mat production used by household as decoration items. The use of harmonious tone color with a variety of colors on the mat plaiting has become the latest, most eye-catching, and unique technique (Fig. 52.9).

Product Design

The production of this plaiting will be more interesting as a result from the latest design and compliance to the current demand. This is fittingly suitable to the advancement of time in which mat plaiting is no longer used today. But back then, every house should have at least one piece of mat plaiting which is used as a cover for a sitting place for the guests. However, there are various types of plastic mat in the market nowadays which are more durable and long lasting. This type of combination aims to make the product long lasting as a result of using plastic parts (Fig. 52.10).

Besides that, this plaiting can be made as a product for daily needs and not only usable at a particular time. Therefore, it could encourage the people to buy this type

Fig. 52.10 The ordinary plaiting is favored by fabric to help strengthen the product that made from mengkuang materials

of plaiting as well as increase its market demand. Craft products based on plaiting are also produced in large quantities typically in the form. To make the bag look more elegant, designers combine the plaiting with other types of materials.

Aesthetic Value

Aesthetic values founded in Malay craft emphasize the depth of features that highlights the effect of the fineness of technique, harmony, beauty, and something that will assert beauty. Everything that has to do with the intricate work can show the identity and patterns of thought, concept, and culture of the Malay community itself more closely. The benefit of manipulating the beauty of an implicit display can be felt and appreciated by the mind and the observation of the woven artwork. The effect of appreciating the woven items' beauty and appeal directly inherited from the Malay world can be felt up to now by the generation of today [14].

The creativity of the plaiters is very much needed so that it is in line with the advancement of times and current demand because it could guarantee the future of these plaiters. According to Ku Hasnah Ku Ishak, a plaiter in Kedah, she has produced *bunga padi* plaiting inspired from the paddy tree which is abundantly available in the state. Kedah which is known as an agricultural state for decades also produces half of the paddy production in the country, supplying much of the Malaysians their staple food. These *bunga padi* plaiting is mostly bought by tourists from Britain, Netherlands, and other countries, and they see it as lavender which can be found in their country (Fig. 52.11).

Fig. 52.11 Bunga padi plaiting which is inspired from the paddy tree

52.5 Conclusion

Learning how to plait must be emphasized to the society so that they are able to appreciate all the mastery, the toil, and the labor undertaken by their forefathers many years ago. They should also be exposed to various techniques and motif types of plaiting for further development. Plaiters must be trained to know all the matters concerning plaiting so that they are able to spread the knowledge of plaiting to the new generations. From the interview carried out, it has been found that most plaiting entrepreneurs carry with them some good knowledge in plaiting, but most of them do not know the name of the shape and motif of plaiting that they have produced. The lack of in-depth knowledge toward the handicraft they are making has become a reason why plaiting does not go further than the borders of this country. Emphasis is vital in order for the plaiters to become more concerned about the kind of work they do so that foreigners will also be able to appreciate this fascinating cultural asset of the nation. Therefore, this research goes deepest in order to find and collect the traditional and latest pattern in *mengkuang* plaiting. Finding from this research will give good impact to our community to study the process of producing plaiting products. Besides that, in the future a new pattern or combination of the traditional with the latest pattern can be done to make sure it is still available in the market.

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Chapter 53
Social Media and Cyber Crime in Malaysia

Azian Mohd Zain, Nur Ekmanita Saberi, Fazlina Jaafar, Farrah Hanani Ahmad Fauzi, Wan Nor Raihan Wan Ramli, and Farrah Aini Lugiman

Abstract "Klik Dengan Bijak" campaign initiated by the Malaysian Communications and Multimedia Commission in July last year did not manage to reduce complaints from the Malaysian netizens about cyber crimes on social media. This translates that the campaign failed to raise the awareness about cyber crimes in social media. The current campaign also failed the test for memory recall. The visual communication design study was directly related to the investigation of the present campaign, seeking new concept and delivering it the unconventional way, focusing only on social media. In order to achieve a higher awareness about cyber crimes and inculcate self-regulatory attitude among netizens thus avoiding from falling into cyber crime traps, the researchers proceeded to investigate the possible approaches most effective in delivering the messages. The finding of this research shows that visual metaphor is the preferred approach.

Keywords Cyber crime • Visual metaphor • Social media • Traps

53.1 Introduction

The Malaysian Communications and Multimedia Commission (hereafter referred to as MCMC) described "cyber crime" as criminal activities that are committed using computer systems [1]. Common types of cyber crimes are:

- Cyber crime includes spamming and copyright infringement especially those involving file sharing through peer-to-peer networks.
- Computer systems could be targets of cyber crime attacks and this would include unauthorized access (hacking), malware, and denial of service (DDoS).

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- Traditional crimes that are facilitated through the use of computer systems include email scam, phishing especially involving financial institutions, identity theft, online gambling, and child abuse images.
- Cyber crime from a national security perspective may include attacks on national critical infrastructure including telecommunication networks and industrial control systems, illegal interception of communications, and hacktivism (a fusion of hacking and activism).

According to MCMC, cyber crime is on the increase because:

- Cyber criminals are exploiting the increased global reach of the Internet and its rapid expansion coupled with weakness in technology and legislation and lack of public education and awareness to develop new crimes as well as facilitate traditional crimes in new ways.
- The Internet has afforded anonymity and ability to evade detection by law enforcement as well as provided a huge pool of possible victims/targets to cyber crooks.
- Many users are not taking computer security seriously, and the vulnerability of their computer is making it easier for cyber crooks to infect the computers and steal valuable personal information.

What makes a crime a cyber crime? While most define it as crimes committed on the net, CyberSecurity Malaysia (an agency under the Ministry of Science, Technology, and Innovation a.k.a. MOSTI) lists cyber crime under three categories:

i. The first is when information and communications technology (ICT) systems and intellectual property become targets of exploitation, intrusion, identity, and information theft.
ii. The second is when ICT devices are used as means to commit crimes. For example, computers at home are used to run malicious programs to intrude other computers to steal money, identity, and passwords.
iii. The third category is where the ICT devices are used as mediums of committing crimes. For example, sedition, disharmony or unrest, slandering, and instigating at a higher scale come under this category.

This is a preliminary research to investigate the effectiveness of the *Klik Dengan Bijak* campaign (or Click Wisely), initiated by the MCMC in July last year, to create awareness among Malaysians about cyber crime among social media users. Of date, MCMC has received 1,200 cyber crime complaints nationwide since January 2013, a similar figure from last year indicating that cyber crimes are still rampant [2]. Internet users are not aware of these crimes being committed and keep falling into these cyber crime traps. These traps do not solely appear on Malaysian shores but worldwide as well. According to a report by Go-Gulf.com, cyber crimes are growing and the CyberSecurity market is expected to skyrocket to $120 billion. Malaysia cases, albeit smaller in numbers, will need to curb the case numbers before it balloons to bigger numbers.

According to MCMC statistics report, age group 15–19 is the age category that is most active online for more than 8–15 h of use per week, where 94% of online activities are searching for information. General online procedures dictate that registration is required to access the sites in full, exposing the Internet user's vulnerability in choosing personal information for usernames and passwords during registration. Online activities such as searches, e-mails, financial transactions, online shopping, and social portals can be dangerous to first-time users and the naïve surfers. The MCMC outreach and engagement division head, Ms. Eneng, Faridah Iskandar said that with the complaints received by the commission, it is essential to understand the dangers one may encounter while surfing the net as social media is easily accessible. In the case of Facebook, the minimum age to have an account is 13 years old. Young users do not have the awareness of the criminal intentions from others. Vulnerable parties looking for relationships will not be able to detect the criminal intent of the perpetrator. This research is streamlined to social media usage, targeting teenagers as the largest group of audience identified by MCMC. Wikipedia lists 202 social networks with Facebook taking a clean lead at 1 billion users. The most common cyber crime complaints received nationwide by MCMC is:

(i) Impersonating
(ii) Hacking
(iii) Falsely accusing
(iv) Threats

And these crimes are committed through social media websites (Fig. 53.1).

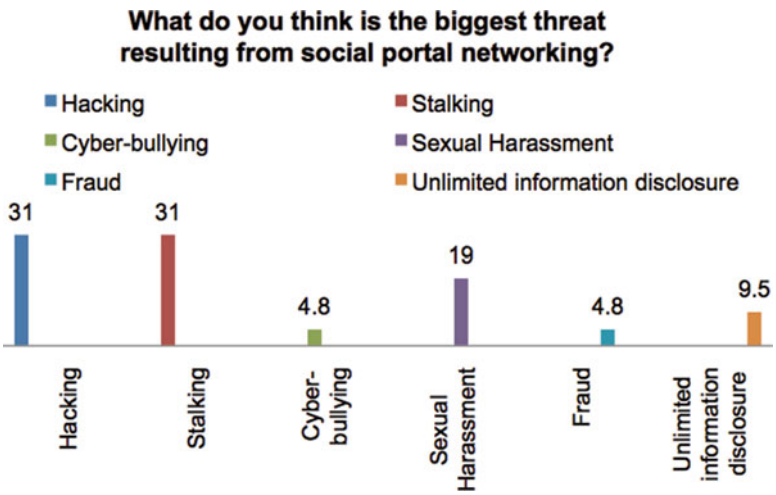


Fig. 53.1 Survey result on the most common threats affecting social media users

53.2 Methods

Initial investigation points out that Malaysians on social media are facing threats of falling into cyber crime traps. The "Klik Dengan Bijak" campaign that was launched in July 2012 helped spread the information about the do's and don'ts when on social media and the precautions that the public should practice when online or surfing with these social sites. However, based on the researcher's survey by questionnaire, the campaign had less or no effect to the respondents because most of them were unaware about the campaign. They also reported hacking and stalking as the top threats on social media.

Based on these observations, the researchers analyzed the "Klik Dengan Bijak" campaign and found that the information regarding self-regulation on social media has less impact compared to other issues listed above. This gave the researchers the idea to design a message to increase the public awareness about cyber crime and practice self-regulation when using social media. The researchers proceeded to distribute questionnaires, containing 23 questions, to understand what type of ideas or approaches is preferred by the respondents by hand and also through Internet survey, freeonlinesurvey.com., aging between 18 and 25 years old, making up the biggest group. Forty-three respondents returned the questionnaires and stated their choice of approaches that were listed on the questionnaire, which are:

1. Entertaining and fun
2. Serious and formal
3. Straightforward
4. Sarcastic
5. Metaphor
6. Scare tactics

The respondents selected metaphoric approach garnering 51.2%, leaving behind scare tactics at 16.3% as the second choice. To a question on the strength of visual metaphors, respondents stated that visual metaphors are interesting and creative, compared to the other five approaches. Hence, the response gave the researchers an idea to use the report from MCMC and CyberSecurity Malaysia (such as cyber stalking, cyber bullying, sexual harassing, identity theft, fraudulent activities, or sexual predators) to create visual metaphors using images to create the link between the different ideas in the advertising message.

Taking the three reasons identified by MCMC as to why cyber crime is increasing, and using them as the crime of example, the visuals were conjured. The ideas center on situations displaying good and bad intentions, thus reminding the reader to be careful when giving information to strangers [3] (Figs. 53.2, 53.3, and 53.4).

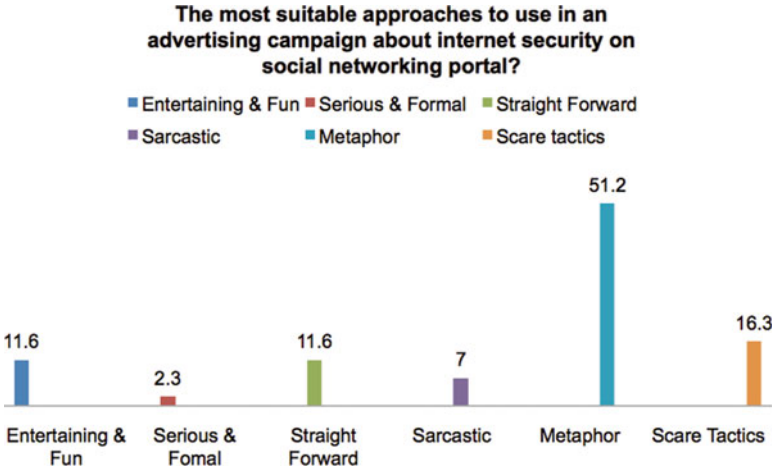


Fig. 53.2 Survey result on the most preferred advertising message approach

Fig. 53.3 Survey result on the effectiveness using visual metaphor approach

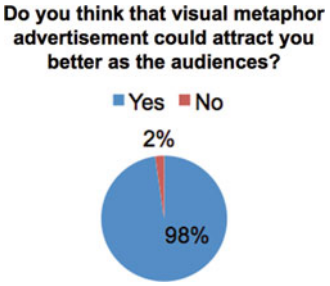
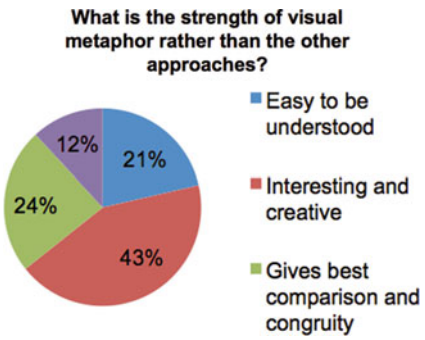


Fig. 53.4 Survey result on the strength using visual metaphor approach in contrast with other approaches



53.3 Results and Discussion

The key issue in this visual research is the manipulation of visual metaphors in communicating the potential danger of criminal activities committed in the cyber world to avoid falling into the trap, while infusing the messages with interesting and creative thought in order to catch and retain the reader's interest [4]. The respondents' choice of approach is metaphoric technique as illustrated from the following examples of print advertisements (Fig. 53.5):

The visual is then supported by copywriting that gives caution to the reader not to fall into a trap when surfing online and to give careful forethought when clicking [5, 6]. The visual metaphors are the focus of the message, as the finger stops in midair, with the traps waiting on click amid the setting of computer in the background.

The following series of advertisements [7], also using the metaphoric approach, illustrates the situation that netizens may encounter if they are unaware of the danger a stranger can accord. They represent the idea of the falling into the cyber crime trap concept using two situations to communicate good and bad intentions (Figs. 53.6, 53.7, and 53.8).

The idea is then extended to shopping mall using guerilla advertising (Figs. 53.9 and 53.10).

Fig. 53.5 The visual manipulation of the idea "avoiding the fall into the cyber crime trap" using symbols of different types of trapping instruments that are placed on a computer track pad, the keyboard and the mouse

Fig. 53.6 A trap set with financial gain in mind

Fig. 53.7 A trap set with predatory gain in mind

Fig. 53.8 A trap set for stealing identity

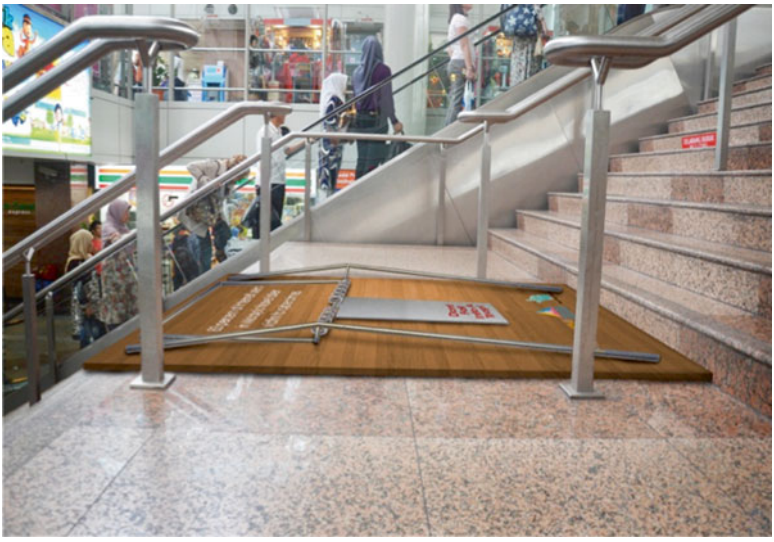


Fig. 53.9 Using guerrilla advertising in a shopping mall, a visual manipulation image is placed at the bottom of the stairs, symbolizing the falling into the cyber crime trap

Fig. 53.10 Using guerrilla advertising in the shopping mall, a message is placed on the door of the lift, and when the lift opens, more information is given

53.4 Conclusion

The selection of visual metaphors that match the respondents' feedback for a more interesting and creative way of presentation is hoped to gain a positive response. Next step would be the pretesting phase to see if these images can be effective in reminding the respondents to be more careful when using social media.

Acknowledgment We would like to express our deepest appreciation to the Faculty of Art and Design (FSSR), Universiti Teknologi MARA (UiTM), Shah Alam, for providing us the opportunity to undertake this research.

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Chapter 54
Bamboo Modular System (BMS) for New Eco Architecture

Zafuan Husri, Mohd Sabrizaa Abd. Rashid, Suzana Said, and Razali Kamisan

Abstract Modular system architecture offers potential benefits of improving flexibility in function allocation, reducing development costs, and improving maintainability and durability. This paper presents a design idea based on Bamboo Modular System (BMS) which is applied to the design of a Bamboo Bus Shelter which will be the New Eco Architecture concept for public use in Malaysia. Bamboo has a great potential in the construction industry, especially on its application to architectural design. The advantages of bamboo are that it is cheap, flexible, and tough (a lightweight material).

Keywords Bamboo architecture • Architecture modular system design • Sustainable development • Eco architecture

54.1 Introduction

Bamboo is used as one of the valuable natural construction materials due to its strength and aesthetic value. The strength and durability of bamboo are the main characters that clarify the appropriateness of their architectural application. In terms of its structural properties, bamboo is well known as an extremely strong fiber, with

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twice the compressive strength of concrete and roughly the same strength-to-weight ratio of steel in tension, which allows it to handle long spans in an architectural design [1]. The aesthetic value can be perceived from its use on the concept of sustainable technology and green architecture. Proven by some experiments, many researchers recognize the efficiency of the high-performance and ultra-economical technology of bamboo [2]. By putting some effort on creativity and innovation, the use of bamboo for architectural design can be enhanced. Modular system architecture, such as integrated modular avionics (IMA) in the aerospace sector, is being seen as offering the potential benefits of improving flexibility in function allocation and reducing development and construction costs, as well as a mean of managing the ever present issues of technology obsolescence and update [3]. A more promising approach is the attempt to create a modular, compositional approach to constructing safety arguments which has a correspondence with the structure of the underlying system architecture.

However, to establish such arguments will require a system architecture which has been designed with explicit consideration of enabling properties such as independence (e.g., including both noninterference and location "transparency"), increased flexibility in functional integration, and having low coupling between components [3]. Based on these initiatives, this paper will discuss on the development of a new eco architectural design innovations, where the study will be based on the potential of bamboo in modular system application.

54.2 Program Background

This program is basically created as an initiative to use bamboo towards producing a new eco contemporary architecture technology, since they are easily found in our natural tropical setting. The combination of traditional techniques with new technologies through the use of bamboo will create a contemporary vernacular architecture style. In terms of economic growth, it has the potential to be marketed locally and internationally. For the initial stage, the focus in this program is the production of a bus shelter design for public use. A bus shelter, created from bamboo design, will lead a new character and identity for cities in Malaysia. Indirectly, it will allow an image of implementing the green technology and sustainable development in Malaysia. It will also have an impact on the local tourism industry, which then will be a path of generating profit. The new design will be introduced and marketed to local authorities and local government. This project combines experiences of Design Principles Sdn. Bhd. together with KUTAI (Centre for Knowledge & Understanding of Tropical Architecture & Interior, UiTM Perak) and FSPU (Faculty of Architecture, Planning and Surveying, UiTM Perak) as well as the involvement of FRIM (Forest Research Institute Malaysia) as a consultant for tropical forests. This robust collaboration is expected to produce a new contemporary architectural design using bamboo with high commercial value.

54.3 Bamboo Species and Its Characteristics in Peninsular Malaysia

Bamboo is found in abundance although they are widely scattered in about five percent of the total forest reserve area in Malaysia [4]. Malaysia is endowed with more than 50 species of bamboo, wherein 25 of them are indigenous, while the rest are exotics [5]. The function and the applications of each bamboo are related to their species and characteristics. However, based on Abd. Razak and Abd. Latif, 1995, only 13 species out of the total species are known to be commercially utilized. This consists of *Bambusa blumeana* (buluh duri), *B. vulgaris* (buluh aur/minyak), *B. heterostachya* (buluh galah), *Gigantochloa scortechinii* (buluh semantan), *G. levis* (buluh beting), *G. ligulata* (buluh tumpat), *G. wrayi* (buluh beti), and *Schizostachyum brachycladum* (buluh lemang) which are widely used in furniture, basketry, craft, parquet, and structural application [6].

The use of bamboo in the construction industry and architecture is based upon appropriate selection of bamboo, which is seen through the bamboo characteristics themselves. The information is very important to assess its suitability and compatibility for various end products and usage [7]. On the other hand, their physical and mechanical properties are closely related to structural application [7]. Besides that, the research on the anatomical, physical, and mechanical properties is also important for the selection of appropriate bamboo species for industrial use, building construction, and housing [8]. The parameters used are the anatomical properties such as fiber length, vascular bundle distribution, and size, as well as cell wall thickness, while the physical properties measured are their moisture content, density, and shrinkage. On the other hand, the mechanical properties measured include shear, compression, and bending strength of a bamboo [4].

54.4 Bamboo Usage in Malaysia

The frequency of bamboo construction in Malaysia is still at the lowest point. The bamboo industry in Malaysia goes back to 1950, when bamboo was commonly exploited for craft and agricultural needs years ago [4]. Most of bamboos are used for production of handicrafts, weaving walls, fences, vegetable containers, and hogs. However, bamboo is believed to be very close with people's lives in tropical regions, especially in the Malay world. It has become an integral element in traditional Malay architecture besides wood, palm trees, and rattan, where Malay vernacular architecture is highly admired because of its eco-friendly architecture and custom-friendly and user-friendly culture.

The use of bamboo for the construction industry and architecture requires appropriate selection of bamboo though. This information is essential in order to test whether it is compatible with various products [9]. In addition, the study on the anatomical, physical, and mechanical properties is also important for the selection

Fig. 54.1 Ihsaniah Iskandariah Mosque, Perak, Malaysia, in 1938. Its walls were made of woven hand cut bamboo strips and it had no minaret

of suitable species of bamboo for industrial use, construction, and housing [4]. Figures 54.1 and 54.2 show typical utilization of bamboo as construction materials.

54.5 Bamboo as New Eco Architecture for Sustainable Development

Bamboo is one of the most sustainable building materials found in natural habitat [10]. It is a renewable natural resource with simple physical attributes and known as an environmentally friendly material because the waste from the development is nonpolluting and can be easily disposed. Through new technologies on preservation and conservation, bamboo construction will be more durable with better performance. Apparently, there are many types of designs that help to solve problems regarding bamboo architecture over the years. Starting with simple drawings and constant follow up and finally with building model, we can fill the technological gap by adding the scientific knowledge and technological expertise to make the locally available material; bamboo to be more acceptable and demanding stronger construction, enhancing durability as well as the practicality [11]. Figures 54.3 and 54.4 show the versatility of bamboo as a structural material.

Fig. 54.2 Examples of school building design using bamboo in Bali by PT Bambu architects. Indonesia gained worldwide attention on the use of bamboo and potential of new design

Fig. 54.3 Shoei Yoh: Project "grating-shell construction" in Chikuho-Fukuoka

Typically, sustainability of the built environment focuses on the adaptation of local materials to utilize the natural resources of the local environment. By adapting them to the surroundings, for instance, the building utilizes the natural resources of

Fig. 54.4 Curve bamboos as column (courtesy of Simon Velez)

light, ventilation, and vegetation to allow it for more efficient operation. The main aim is to reduce the impact on the environment and its usage and occupancy, as well as to minimize the operation costs of the building for the whole life span [12].

54.6 Architecture Modular System Design

The existence of a modular system for each design will provide a holistic positive impact not only on consumers but also on the designers themselves. Recently, modularity is considered a promising tool to develop a variety of products using the same modules of components known as platforms [13]. A modular principle offers a firm to build complex product through the integration or assembly of smaller modules or subsystems which are developed independently but function together as a whole [14]. This type of architectural system contains modules that can be used as self-contained building blocks for high-level systems. Each module will interact with another through standardized interfaces that define functional spatial and other relationships among the components [15]. While modular components is developed autonomously by different groups, coordination of the overall development process is generated because of the presence of interface specifications embedded in the architecture; therefore, it will shift the burden of coordination away from managerial authority [16].

In addition, modularity is a mean to accommodate uncertainty [17]. It is flexible because standardized interfaces will allow for variations in components [19] that may be substituted in response to market and technological changes [18] (Figs. 54.5, 54.6, 54.7, 54.8, 54.9 and 54.10).

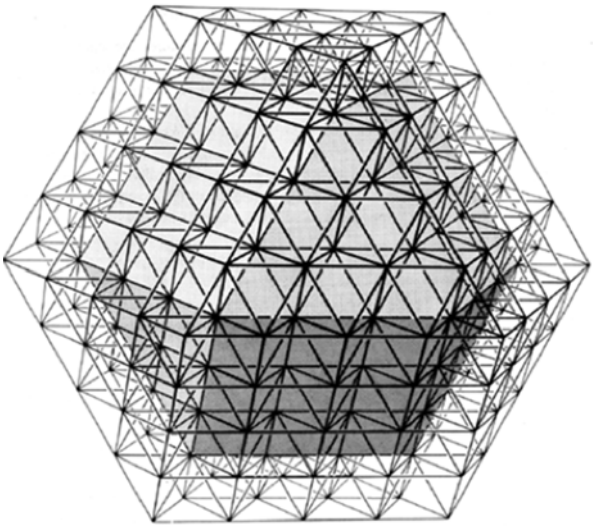

Fig. 54.5 The conceptual form of modular system application

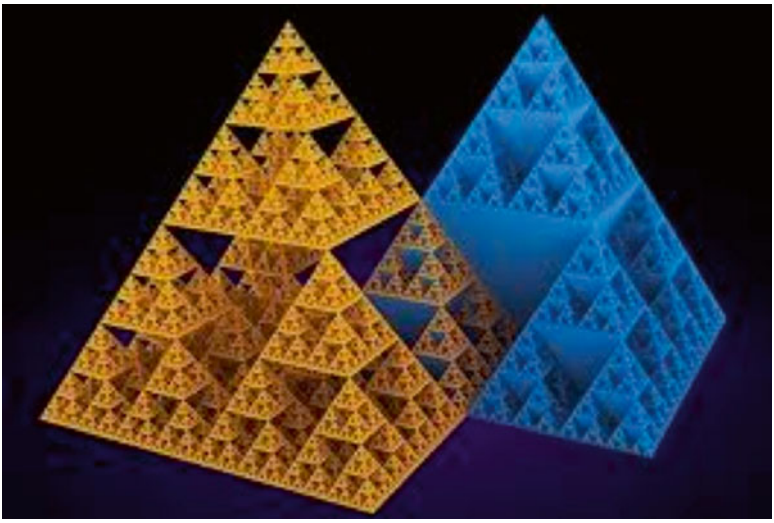

Fig. 54.6 An intriguing structure of pyramid concept

54.7 Design Method for BMS

The design for the Eco Bus Shelter was made by UiTM Perak's students with supervision by the faculty members from the Faculty of Architecture, Planning and Surveying who are also actively involved in KUTAI activity. The design concepts are based on these criteria:

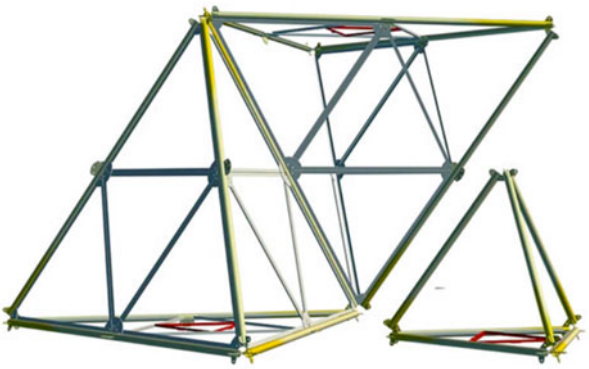

Fig. 54.7 "Sierpinski pyramid" structures based on modular system design from Archinoma Modular System Product, UK, 2011

Fig. 54.8 A sophisticated triangulated structure strengthening the construction of mobile tent

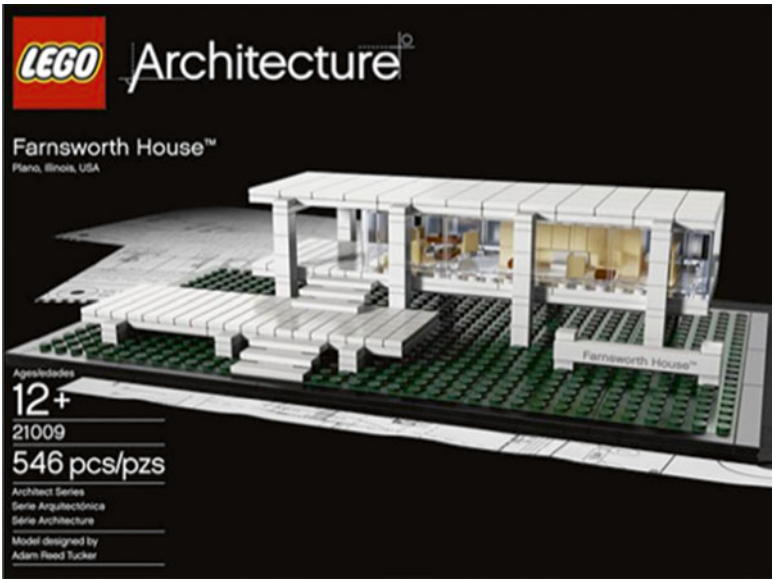

Fig. 54.9 Application of modular system on LEGO company product – LEGO architecture

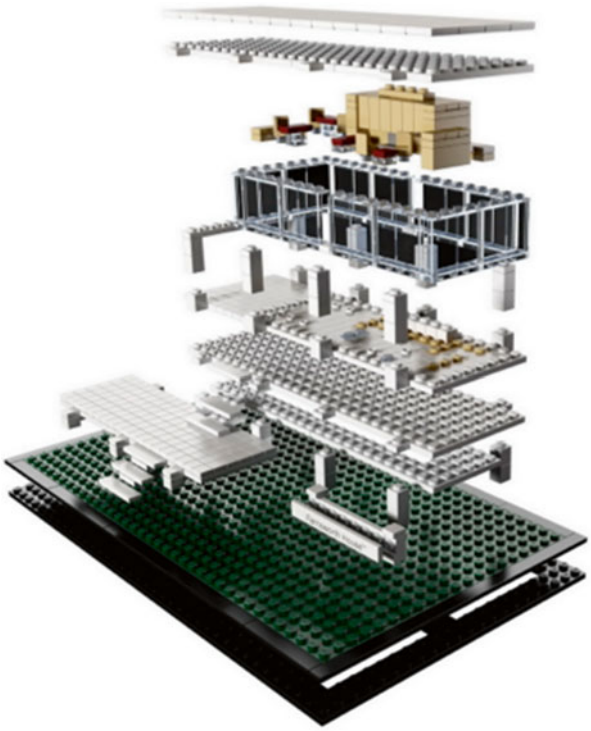

Fig. 54.10 A basic building construction of Lego through the segregation of floors, walls, pillars and roofs.

- Bamboo as the main element/material
- Flexible and functional on every aspect of design
- According to the appropriate scale dimension – anthropometry
- Contemporary architecture feature
- Creating a new revolution to bamboo architecture
- Minimum usage of alternative material other than bamboo
- Creating an efficient and sustainable construction system
- Easily operated and updated in terms of structure
- Minimal construction cost and easy to market

The design process was carried out in two phases: the production of concept and ideas and the improvement and development of the design. The two phases were successfully conducted and developed by the available expertise at KUTAI in UiTM Perak. Product suitability is determined by the Design Principles Sdn. Bhd. as an industry pioneer (Fig. 54.11).

There were seven designs produced by the students as a result of their participation to this research. The three best designs that meet the research criteria and objectives were selected to be developed in the next phase (Figs. 54.12 and 54.13).

For the last progress of design phase, the best design was selected based on creativity, flexibility, and functionality.

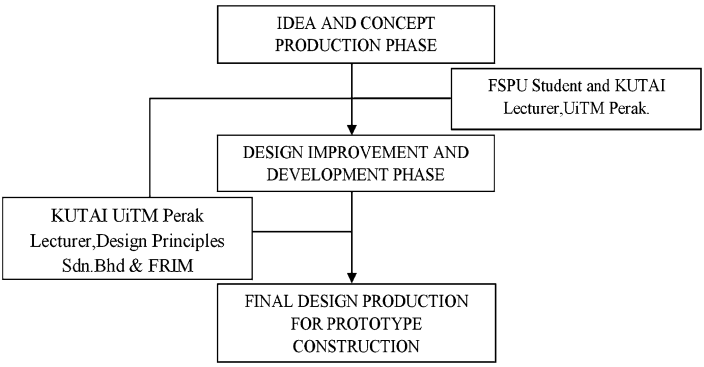

Fig. 54.11 Phase and involvement of the design process

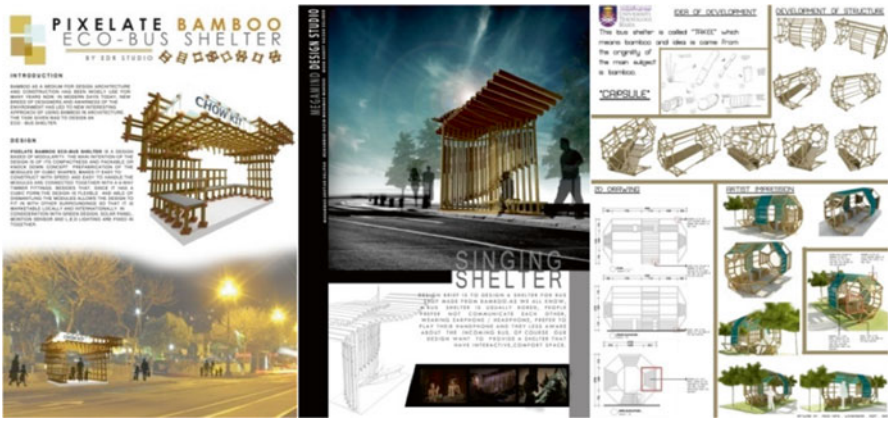

Fig. 54.12 Design concept from FSPU students and KUTAI Academia UiTM Perak

54.8 The Result: BMS Application for Bamboo Bus Shelter Design

The selected design was chosen due to its approach in using the bamboo in Malaysian contemporary architectural context and in line with global requirements of sustainable development and green technology. The design is not only effective on natural aspect but also highlights the modular system as a feature of sustainable development on bamboo architecture in particular.

Figure 54.14 shows a simple cube shape of the modular system. Modular system has an impact on each component of the connection. In order to test the strength and integrity of the modular system design, a testing prototype was built in 1:1 scale.

Fig. 54.13 Selected inventions to be taken to the next phase and built as a prototype model

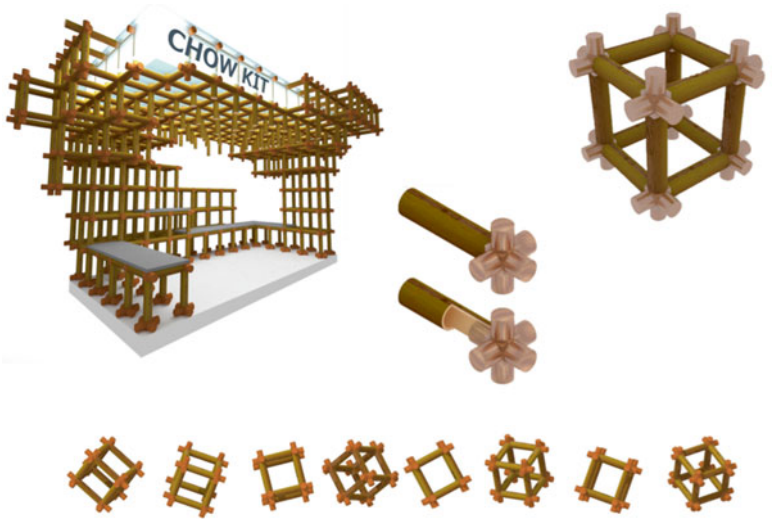

Fig. 54.14 A designer highlighting a modular system as structural system based on Bamboo Bus Shelter

54.9 Construction of Testing Prototype for BMS designs

Figure 54.15 shows the development of the modular system prototype. *Gigantochloa scortechinii* (buluh semantan) is the selected bamboo species to be used in the construction of this prototype model based on population and moderate durability, though functionally, it is not the best choice of bamboo species for building structure, but it is a major challenge in highlighting local species of bamboo in construction.

A modular cube structure measuring length of 375 mm for each side was constructed, while the connection system for the cube structure is made from wood. The 375 mm size measurement is the initial assumption on the suitability of this

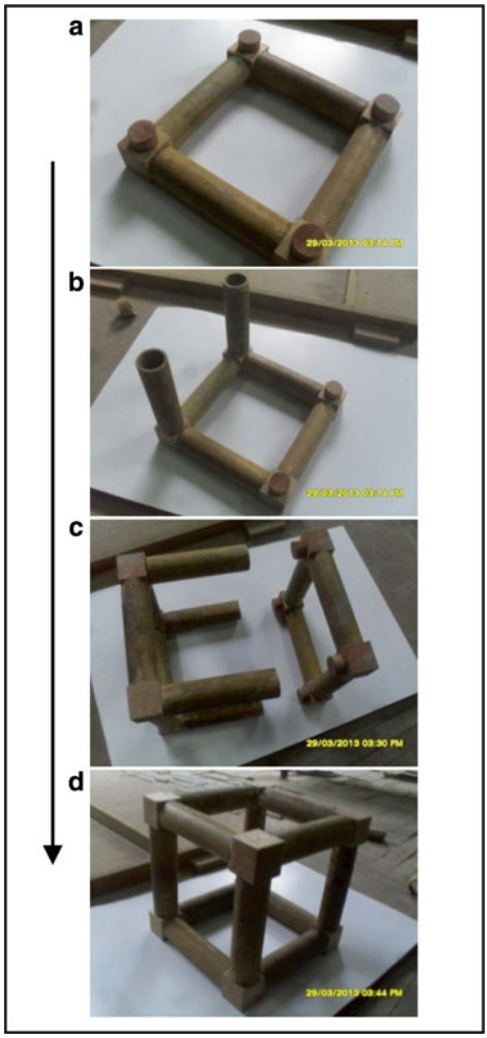

Fig. 54.15 Development (**a**–**d**) of test prototype components for Bamboo Modular System design of this research

Fig. 54.16 The connector used in the system from wood material

Fig. 54.17 Temporary Bamboo Workshop construction process at UiTM Perak involving activities with FSPU students, KUTAI UiTM Perak Academia, and the Design Principles Sdn. Bhd. The combined results of series bamboo modular cube designed are fundamental to the construction of this Bamboo Workshop

scale modular cube structure. It is directly proportional to the weight and length of the span in accordance with the invention that was made.

Measurement accuracy of modular cube size is based on the load, the force of gravity, long span, and level bendisng. It can be determined by strength test and load test of a Modular Cube Prototype. For the time being, the testing phase is still in the progress and will be discussed in the next phase (Figs. 54.16 and 54.17).

54.10 Conclusions

Through creativity and innovation, a variety of smart solutions to the design problems are highlighted. For example, applications of modular system in a design did not only minimize the cost and energy used in a building construction, but it is seen more workable as a holistic system. Modular system implementation and application of this project not only has given impact on the design but also has indirectly commercialized bamboo as a contemporary building style.

The strength of this project was due to the support and cooperation of the industry and government in all aspects. The collaboration of expertise in each side not only facilitates the movement of research but also provides positive reinforcement towards the use of bamboo as a natural resource. This research is timely in manner, in line with the government's efforts towards sustainable development and green technologies.

Acknowledgment This research work was carried out with the collaboration and assistance -of the Design Principles Sdn. Bhd. and FRIM (Forest Research Institute Malaysia). The study was supported by the KTP Scheme, Department of Higher Education, Ministry of Higher Education (Malaysia).

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Chapter 55
Investigating Feasibility of Mobile Learning (M-Learning) for History Lesson

Nurwahida Faradila Taharim, Anitawati Mohd Lokman, Wan Abdul Rahim Wan Mohd Isa, and Nor Laila Md. Noor

Abstract There is a growing concern for lack of interest among students in the history lesson. To overcome the problem, various efforts are seen towards the development and implementation of Mobile Learning (M-Learning) application as a new learning tool in the national education system. The main objective of this study is to investigate the feasibility of M-Learning for history lesson at a secondary school. A survey was conducted with 45 students from a secondary school in Malaysia. The results unravel the existing perception of secondary student towards the history lesson and their preferences of using M-Learning as a learning tool. The results also provide insights on current learning preferences of Generation Z students. Future work involves incorporating playful elements in M-Learning interaction design.

Keywords Playful interaction • Mobile learning • History

55.1 Introduction

According to the Interim Strategic Plan (*Pelan Strategik Interim*) 2011–2020, by the Malaysian Ministry of Education (MoE), virtual learning is one of the essential strategies developed under the plan. In line with the new requirements, the plan aims to optimize the use of information and communication technologies (ICT) to support the process of teaching and learning. There are various projects from MoE towards the adoption of e-learning with the Internet, intranets, satellite, audio, video, interactive TV, and CD-ROM. For example, Frog VLE under 1BestariNet, with the collaboration of Yes Network and YTL Communications, is one of the MoE's projects, used in nearly 10,000 schools, nationwide. Frog VLE is a web-based application that encourages accessibility and multiple learning styles and creates an engaging learning experience.

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The learning activities do not necessarily happen only in the classroom but almost everywhere [1, 2] with the proliferation of new technology and mobile devices. The development and implementation of specific application, technology, and mobile device for education should be integrated with the interactive elements and components to support the teaching and learning activities. History will be made a must-pass subject in the *Sijil Pelajaran Malaysia* (SPM) examination, beginning 2013 [3]. Thus, there is a need to develop a specific application to boost the knowledge and interest among Malaysian students towards history lesson.

Currently, the revolution and innovation of mobile technology for education is being reflected from Mobile Learning (M-Learning) [4]. In general, M-Learning brings forward a new perspective and gives advantages to teachers to conduct their lesson anytime and anywhere. The invention and innovations of mobile devices such PDAs, smartphones, iPads, and tablets have become important tools for teachers and students to support the teaching and learning activities. According to Mahamad et al. [5], M-Learning solves the learning time constraints faced by students and teachers. With a cohesive M-Learning framework to support the development and implementation process, future M-Learning could be realized successfully [5] for Generation Z students.

55.2 Mobile Learning (M-Learning) for History Lesson

History lesson is often said to be a difficult and dull subject by the students. The reasons are (i) abundance of information related to historical events; (ii) facts, names, and dates that require memorization and in-depth understanding; (iii) lack of interest in history lesson among students; and (iv) lack of engaging in learning activities. Hence, the students showed less interest in learning the history lesson [6].

Lack of creativity in teaching history lesson also contributes to the boredom and loss of interest among students. According to Zin, Jaafar, and Yue [7], a 3D and multimedia technology should be used in history lesson to make it more interactive, interesting, and effective [7]. Mobile Learning (M-Learning) is considered essential towards the development and implementation of electronic learning (e-learning) [4, 8].

Experiential design capitalizes the interactive media to create experience that produces desired perceptions, cognition, and behavior by incorporating affective or emotional design elements in the interaction [9–12]. One such interaction is the playful interaction which is mostly seen in computer game design [13]. Playful interaction emphasizes the elements of enjoyable, pleasant and may extend its usefulness in the development and implementation of M-Learning applications.

Elements of playful interaction should be incorporated in the M-Learning technologies and applications. It encourages students to engage more in the process of learning history lesson. The adopted elements of playful interaction in the design of M-Learning applications may create a fun, enjoyable, and effective learning experience [14, 15]. Table 55.1 shows elements of playful interaction or also known as playfulness. There are 18 elements of playful interaction (playfulness), in which

Table 55.1 Elements of "playfulness" [12]

Playfulness	Deliverables and Criteria
Control	Domination and rule
Creation	Expression of creativity and manipulation
Exploration	Expedition and scouting
Discovery	The excitement that learners might feel when they discover something new
Difficulty	The type of pleasure when learner's skill is being tested in order to achieve an objective
Competition	Feeling pleasure when competing with other learners
Danger	Learner enjoys the pleasure of feeling scared, risky, and unease
Captivation	Attraction and mesmerization
Sensation	Excitement in sensing something, for example, a touch, body movement, sound, and feel of the texture of an object
Sympathy	Shared emotional feeling
Simulation	Imitation of something from a real life. For example, the SimCity is a simulation game that is imitated from real life [13]
Fantasy	Imagination
Camaraderie	Intimacy or the pleasure of developing friendship or fellowship
Subversion	Breaking the rule
Challenge	To compete or to test the abilities to fulfill a required task
Completion	Successful completion of a demanding task
Humor	Learner develops amusement feeling while learning
Thrill	The excitement and suspense feeling

each has its own criteria and deliverables [16] that may be feasible to be incorporated in the interaction design elements of M-Learning.

55.3 Research Methodology

The aim of the survey questionnaire is to investigate the feasibility of Mobile Learning (M-Learning) for history lesson among secondary students. A survey was conducted with 45 students from a secondary school in Malaysia. A set of questionnaires had been distributed to 45 students from Form Four classes at a public secondary school in Kuala Lumpur, Malaysia. The compositions of the 45 students are from two Form Four classes: (i) Class A and (ii) Class B. Class A consists of 20 students and Class B consists of 25 students.

55.4 Results and Findings

The results unravel the existing perception of secondary student towards the history lesson and their preferences of using M-Learning as a learning tool. The results also provide insights on current learning preferences of Generation Z students. The

analyses discussed in this section are (i) respondent profile, (ii) mobile device usage, (iii) Mobile Learning (M-Learning) traits, and (iv) student perceptions towards history lesson. The findings and results shown in descriptive statistics manner can be seen as follows.

Respondent Profile

Based on Table 55.2, majority of 67 % of the students own a handheld mobile device. The handheld mobile devices referred here are smartphones, iPads, tablets, or PDAs. Even though the percentage of students that own a mobile is not so much convincing, more than 89 % of the parents or family members of the students own a mobile device. The students have the access or may be able to use mobile devices even if they do not own it.

Mobile and Internet Usage

Table 55.3 shows the frequency of the student using mobile device. The table shows that 73.3 % of the students use the mobile more than three times a week. However, there are still 11.1 % of the students that never use mobile devices.

Table 55.4 shows the frequency and percentage of the student's purpose of using the mobile. The purpose of using the mobile is divided into four categories: (i) form of communication such as e-mail and online chat, (ii) browsing and searching for information, (iii) leisure or entertainment, and (iv) study or revision. Based on Table 55.4, 91.1 % of the students used mobile device for communication. In addition, there are only 37.8 % of the students that use the device for studying or doing revision.

Table 55.2 Ownership of a mobile device (students or family members)

	Self-owned				Ownership from parents or family members			
Ownership	Yes	%	No	%	Yes	%	No	%
Smartphone/iPad, tablets/ PDAs	30	67 %	15	33 %	40	89 %	5	11 %

Table 55.3 Frequency of using mobile device

Item	Frequency	%
Once a week	6	13.3
Twice a week	1	2.2
More than 3 times a week	33	73.3
Never	5	11.1

Table 55.4 Purpose of using mobile device

Item	Frequency	%
Communication *(*e.g., *e-mail, chat)*	41	91.1
Browsing and searching for information	30	66.7
Leisure/entertainment	28	62.2
Study/revision	17	37.8

Table 55.5 Student preference on learning techniques for history lesson

Item	Frequency	%
Role play	9	20.0
Field trip	29	64.4
Quizzes	12	26.7
Discussion	10	22.2
Assignment/group work	10	22.2
Storytelling	26	57.9

Table 55.6 Student preference on medium of learning aid or tool for history lesson

Item	Frequency	%
Textbooks	7	15.6
Film/TV clip	26	57.8
LCD (slide presentation)	13	28.9
Learning using mobile *(Mobile Learning) (M-Learning)*	22	48.9

Mobile Learning (M-Learning) Trait Analysis

Table 55.5 shows that 64.4 % of the students preferred a "field trip" as learning technique to be considered by teachers to teach history lesson. In addition, 57.9 % of the students preferred a "storytelling" technique. This may be due to the general characteristic of Generation Z (also known as Digital Natives or Generation Z) that is surrounded with mobile devices and video game consoles. In general, Generation Z prefers visual learning rather than kinesthetic or auditory learning. Visual learners usually prefer watching interactive media and game playing. They think medium of learning might be more interesting with pictures and visual images. To help them understand, nonverbal cues such as body language and the storytelling-related activities [17–21] may enhance the learning process.

Furthermore, Table 55.6 shows that majority of the students prefer some sort of film or TV clip as the medium used for the learning aid. A majority of 48.9 % students preferred learning using mobile devices. This may be due to game-based application considered to be an effective tool in learning history. There are only 15.6 % of the students who still preferred a traditional lesson style whereby textbooks are used as a medium of learning aid. This may due to general characteristic of Generation Z

as avid multitaskers [22]. In general, Generation Z does multiple things with one device [22]. Generation Z prefers iPad as it is simple and small to carry [22]. Generation Z also prefers interactive, stimulating activities rather than passive TV program [22].

Student Perceptions Towards History Lesson

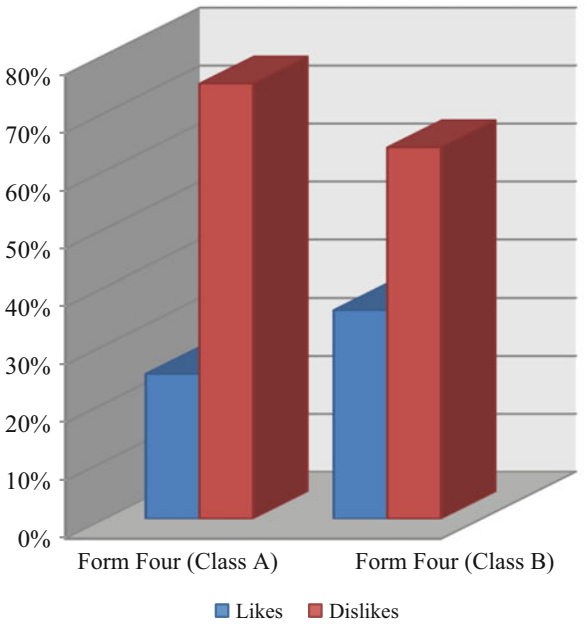
Table 55.7 and Fig. 55.1 show that more than 60 % of students of both classes dislike history lesson. The reasons are shown in Fig. 55.2. The general reasons are (i) hard to memorize or understand *(22 % of students)* and (ii) not interested or boring *(45 % of students).*

Figure 55.2 revealed that 45 % of students are not interested in learning history. Twenty-two percent of students think that "history" lesson is hard to memorize and understand. The reasons are (i) abundance of information related to historical events and (ii) facts, names, and dates that require memorization and in-depth understanding. Hadi et al. [23] explain that to avoid boredom and loss of attention during the lesson, incorporation of game elements may be imperative when designing applica-

Table 55.7 Student preference towards learning history

	Likes	Dislikes
Form Four (Class A)	25 %	75 %
Form Four (Class B)	36 %	64 %

Fig. 55.1 Graph of student preference towards learning history



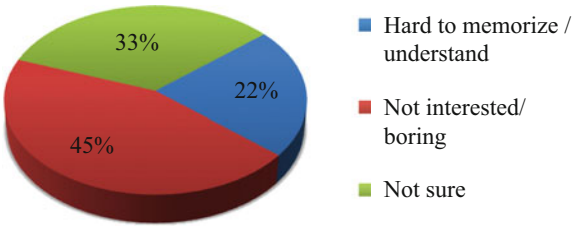


Fig. 55.2 Percentage of reason for dislikes

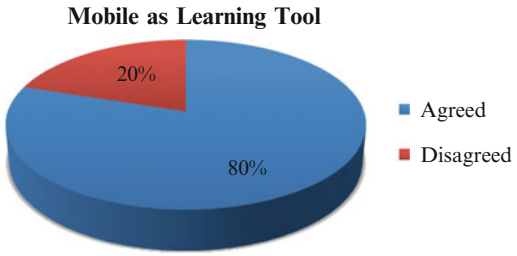


Fig. 55.3 Pie chart of student's opinion on mobile as a learning tool

tions for history lesson [23]. The usage of M-Learning with relevant techniques will help the students in understanding and memorizing the facts easily [24].

Figure 55.3 showed that 80 % of the students from both classes agree that mobile devices such as smartphones, iPad, tablets, and PDAs can be used as effective tools to help them learn history lesson. The proliferation of new technologies and mobile devices will create a new learning experience for the younger generation. Most of them preferred to use technology devices to help them in their studies. Teachers may need to integrate the teaching and learning process through the usage of mobile devices and applications embedded with aesthetic, playful, emotional, and pleasurable elements [25].

An interview session was conducted by Mohamad, Maringe, and Woollard in 2012 to gather opinions from the experts on mobile phone deployment in Malaysian school. The individually interviewed respondents are English subject leaders, ICT subject leaders, and stakeholders from the school management such as head teachers and deputy head teachers from the United Kingdom and Malaysia as well as officers from the Ministry of Education, Malaysia. The respondents concluded that it would be such a waste if mobile devices are not being used in education, and they gave positive responses towards the possibility of change in education [26].

The similar interview session has been conducted towards the students and academicians from Malaysia Multimedia University (MMU). The result showed that the students agreed that mobile learning will make their life easier and the academicians are motivated to upgrade their current phone that is if the university provides a fund [27].

55.5 Conclusions

The government had embarked on the 1BestariNet project and Frog VLE which encourages accessibility and multiple learning styles and creates an engaging learning experience. For future plan, by using the latest technology and devices, new perspective and approach to encourage students' attractions and interest in learning history lesson may need to be realized and practiced successfully. The main objective of this study is to investigate the feasibility of Mobile Learning (M-Learning) for history lesson at a secondary school. A survey was conducted with 45 students at a public secondary school in Kuala Lumpur. The compositions of the 45 students are from two Form Four classes: (i) Class A and (ii) Class B. Class A consists of 20 students and Class B consists of 25 students. The results unravel existing perception of secondary student towards the history lesson and their preferences of using M-Learning as a learning tool. The results provide insights on current learning preferences of Generation Z students.

Future work involves incorporating playful elements in M-Learning interaction design. The adaption of playful interaction design elements in interaction design of M-Learning application for history lesson may cater to the demand of Generation Z students. Future work also involve may also involve conducting preliminary investigations towards identifying relevant mediating and moderating factors that may affect or are being affected by the development and implementation process of M-Learning such as culture, privacy, and other ethical considerations. With a cohesive M-Learning framework to support the development and implementation process, M-Learning could be realized successfully [4].

Relevant theories and practical guidelines from multidisciplinary field incorporating technical, engineering, social, educational, psychological, political, marketing, legal, ethical, cultural, aesthetic, pedagogical, human computer interaction (HCI), Kansei engineering, art, design, and technological advancement should be embraced in creating a holistic M-Learning framework. The vision of creating a comprehensive education system is an ongoing effort towards betterment of future generation. Malaysian citizens with vast knowledge, creative thinking, and talented skills may be produced as the outcome of the national education system. Thus, teachers in Malaysia are being encouraged to have themselves well equipped with the latest M-Learning applications, technologies, and mobile devices to meet the demand and challenges of Generation Z students.

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Chapter 56
An Overview of the Book Printing and Publishing Industry in Malaysia

Shalida Mohd Rosnan, Siti Farhana Zakaria, and Muhammad Yusof Masod

Abstract This paper focuses on the overview of the book printing and publishing industry in Malaysia. The book printing and publishing industry is facing challenges as the e-books are becoming increasingly significant to the young readers. Both e-books and digital printing have significant advantages in many aspects. The impacts of e-books and digital printing on the printing and publishing industry are also discussed. Issues which may encountered by book printers and publishers due to trend changes during the migration from print to electronic publishing are also addressed.

Keywords Book printing • Book publishing • Book industry • E-book • Digital printing

56.1 Introduction

The history of the book printing started in the 1440s with the printing of the Forty-Two-Line Bible by Johannes Guternberg [1]. Early on, printing was concentrated primarily with reprinting of religious, legal, and classical texts already available in manuscripts. Printing in Malaysia started in 1806 by Andrew Burchet Bone, and the first newspaper was distributed on 1 March 1806 known as the *Government Gazette*. One year later, the first Malaysian book was printed, and the title was *The Prince of Wales Island Directory and Calendar for 1807*. In the same year, another local book printed was *The Malay Language* that was written by John Shaw. Munsyi Abdullah was the first Malaysian who had the printing knowledge during the missionary operation in Malacca around the 1800s [2].

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Developments in technology and the Internet have changed the nature of digital content and its accessibility and have opened up new opportunities for the publishing industry. The development of book printing since the Gutenberg era had numerous evolutions and transformations until the present where it started with the first press in the 1440s, lithography to offset printing and to digital printing. The publishing of new titles has kept growing even the conventional publishing industry is facing an emerging challenge from the growth of the Internet and digital publishing [3]. In fact, there has been a growing trend in the number of local new titles. Based on Malaysian National Library's statistic, the total of new local titles published in 2011 was 17,923, and in 2012 a total of 19,171 titles were published [4].

The idea of electronic publishing was introduced since the mid-1970s. The progressing computer technologies and the Internet lead to the spread of electronic media worldwide. With the increasing popularity of the Internet, the paperless publishing is just another new communication channel [5]. Producing the original of electronic publishing was not an easy process. The cost of producing electronic publishing is higher than conventional publishing, due to lack of experienced staffs and facilities required. The development of electronic publishing faces a phase-by-phase stage. The processes are research and development, integration, and innovation in electronic publishing. All these require skilled and experienced people in the industry [6].

In the book printing and publishing industry, associations play a crucial role in enhancing the growth of the industry. Among the major local industry associations are the Malaysia Printers Association (MPA), Selangor and Federal Territory Chinese Printing Presses' Association (SFTCPPA), Malay Entrepreneur Printing Association of Malaysia, National Book Council of Malaysia, and Malaysian Book Publishers Association (MABOPA). This paper aims to investigate the current state of the book publishing and printing industry in Malaysia. The purpose of this paper is to provide an overview of the trend and issues faced by printers and publishers in Malaysia as e-books are becoming increasingly significant to the young readers.

56.2 The Current State of the Book Printing and Publishing Industry in Malaysia

The printing and publishing industry is segmented into a manufacturing sector based on the Malaysian Investment Development Authority (MIDA) report. The manufacturing sector is one of the top five contributors in the Malaysian economy. In 2011, imports of paper and paper products totaled RM 6.6 billion, while its export total is RM3.4 billion. In 2012, imports of paper products totaled RM 6.5 billion, while its export totaled RM 3.5 billion. Majority of printing companies are represented by privately owned or small and medium enterprise (SME) that is employing less than 50 people. The rest of them are categorized as listed companies and foreign-owned, full, or semigovernmental institutions which include university presses or publishing departments [7].

The printing and publishing subsector includes packaging materials, books, magazines, cards, security documents, and other miscellaneous printing activities. In 2011, the printing and publishing industry has recorded investments of RM 43.9 million and RM 490.3 million in 2012. There was a spike increment in the printing and publishing industry in 2012, but the value mentioned has covered all subsectors in printing and publishing. The individual value for book printing and book publishing still cannot be traced clearly [7]. Figure 56.1 shows the total new investments of printing and publishing that include all subsectors.

Figure 56.2 shows the total new investments of pulp and paper and paper products. In 2012, a total of 27 projects were approved with investments of RM 871.6 million. The pulp and paper totaled RM 41.6 million compared to RM 90.7 million in the previous year. There was a decreased value of investments for the pulp and paper. In previous research, Chiang-Nan et al. [3] has found that e-books have significant advantages in many aspects over the printed book. E-books do not

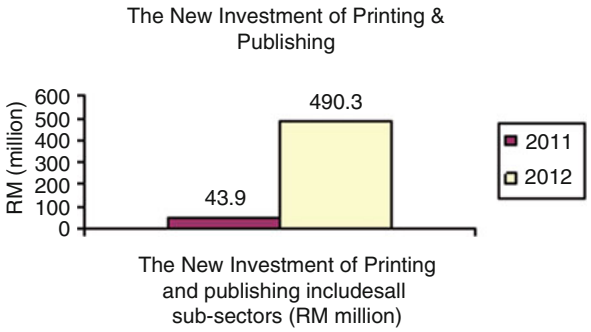

Fig. 56.1 The new investments of printing and publishing include all subsectors in 2011 and 2012 (Source: Malaysian Investment Development Authority (MIDA))

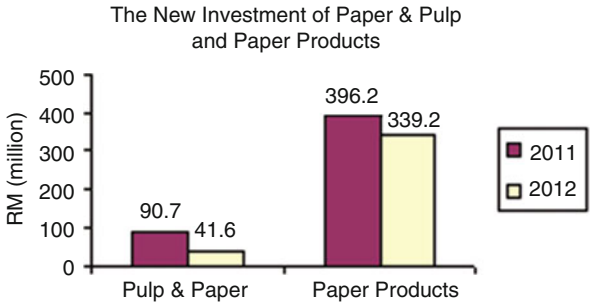

Fig. 56.2 The new investments of pulp and paper and paper products in 2011 and 2012 (Source: Malaysian Investment Development Authority (MIDA))

Table 56.1 The total of applications of printing and publishing licenses for the year 2011 and 2012

New/renew application of license	Year 2011	Year 2012
New application of printing machine license	80	70
Renew application of printing machine license	2,356	1,180
New application of publishing license	423	270
Renew application of publishing license	2,218	1,498

Source: Ministry of Home Affairs (MOHA)
The latest statistics of books registered under the Library Depository Act, 1986

Table 56.2 The total of new local titles published in 2011 and 2012

Subject	2011	2012
Textbook (e.g., academic, professional)	4,638	5,550
Children (e.g., picture book, fiction)	3,837	4,095
Adult (e.g., religion, novel, travel guide)	9,448	9,526
Total	17,923	19,171

Source: National Library of Malaysia

require usage of paper, and this is a challenge to the printing, pulp, and paper industry. The printing and paper industries rely on each other and also the consumption of the printed products.

The printing and publishing licenses in Malaysia are managed under the Ministry of Home Affairs. In 2012, the new applications for printing machine licenses are 70 as compared to 80 in 2011. For 2012 renewal applications of printing machine licenses it was a drop in numbers from 2,356 to 1,180 applications compared to 2011. Similarly, new and renewal applications of publishing licenses decreased in 2012, from 2,218 to 1,498 [8]. These data show that the printing and publishing industry faced a challenge with the rise of digital reading materials that are available online. Even though the numbers of new local titles increased from 17,923 in 2011 to 19,171 titles in 2012, the reduction in the volume of printed materials by publishers had impact on Malaysian printers [4]. This is supported by the data of applications of printing licenses. In 2012, the number of applications of printing licenses is decreased compared to the previous year. Tables 56.1 and 56.2 show the number of local applications of license and the number of new local titles published in Malaysia, respectively.

56.3 The Challenges in the Book Printing and Publishing Industry

Convergence of the conventional and electronic publishing industry is aggravated by the rapid growth of the Internet and alternative delivery channels. Nowadays, searching information through the web is the main preference for people to access

the digital media. Transformation from conventional publishing to electronic publishing is changing the future of the publishing industry. Electronic publishing transforms the contents of books to a dynamic medium [9]. The wave of digital trend in book industry has urged the publishers to be ready with the changes of technology or to be left behind. Publishers have to be in line with the current technology in order to stay alive in the industry.

The impact of e-books upon printed books has been discussed in previous research. McAllister et al. [10] have found that the use of e-books among younger people gave an impact to printed books. Younger people are the largest consumers of the Internet in America. Publishers used the Internet as a marketing tool to promote their e-books. The preference of e-books upon printed books changes the mainstream publishing industry to use digital books rather than printed books. Tian X et al. [11] have discussed that the acceptance of e-books has affected the demand of printed book. This research also recognized that growing interest upon e-books among young people gave an impact on the demand for printed books. The publishers will always face a problem in deciding the ideal volume to print because it will involve their affordability to maintain the cost of managing inventory that does not sell. The piles of stock-up printed books are not a good sign of a good business. Publishers and book printers should consider the findings of the research as this will help to answer their curiosity of the declining demands of printed books. To overcome the issues of overprinted books, most publishers have changed to digital printing. Print on demand or digital printing is a challenge to the conventional printing industry. This is because publishers will prefer to go for digital printing to fulfill low print volume orders in a short period of time. The industry clearly sees the advantages of digital printing regarding to the demand of low volume. To book printers, hybridization of traditional and digital technology will help the future of the industry [11]. The hybrid printing technology which is referring to offset printing and digital printing is needed to ensure that book printers are available to cater the market demand in any range of volume.

The book-buying trend is also one of the challenges faced by the printing and publishing players in the market. The more publishers understand the readers, the better. In the book industry, the younger readers prefer to use the current gadgets such as tablets and smartphones as a new method for reading [3]. In previous research, Jamali et al. [12] have found that readers prefer to use e-books because of its greater breadth and depth collection, ability to download, and fewer restrictions on printing and copying. In the field of education especially universities, digital textbooks and electronic publications on the Internet are getting more significant. The open access service that is offered by the library is a valuable platform for students to look for digital textbooks and other reference materials [13]. The availability of digital textbooks and other digital resources such as online journals helps students to get the resources easier. The online resources are available to the readers in several e-book formats such as Adobe Acrobat Reader, Microsoft Reader, Palm Reader, plain text, and HTML. All these formats are supported by specific software to enable the e-book to be read or viewed on a device. Accessibility to e-books and online resources is better than printed books, and this makes online material more

attractive. The readers can get what they want wherever and whenever they like. The main feature that the e-book has is its function of finding a relevant content that suits the reader by using a command on the keyboard.

56.4 Summary

Book printing and publishing in Malaysia faces challenges that changed the scenario of the industry including transformation of printing machines and processes from offset printing to digital printing. The readers are getting more tech-savvy and are always looking to the Internet for news and information. To keep relevant in the market, book printers and publishers need to adapt to the current trends such as hybrid printing. Book printers and publishers have to learn how to embrace the new technologies to stay relevant in the market. It is recommended that in the Malaysian economy report, the book printing and publishing industry in Malaysia should be segmented individually according to their business nature in order to get clear overview.

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Chapter 57
The Use of Infographics as a Tool for Facilitating Learning

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Abstract Infographics is a combination of the words "information" and "graphics" used to combine the data into a design. It could help to facilitate individuals or organizations in spreading information to the audience concisely. It is known that the misuse of visual communication can affect the concept of communication that was aimed to be presented by using images. Weak design and unstructured images failed to convey ideas and information and the lack of knowledge about visual communication could hinder learners to accurately interpret images. Hence, this study examines the use of infographics as a tool for facilitating learning among graphic design and digital media learners in UiTM Melaka. Ninety-nine learners with similar demographic background have been selected using simple random sampling method. The data collection was via quantitative methodology and descriptive statistics with a set of questionnaire as the main instrument which has undergone content validity and reliability testing. A pilot study was conducted with a Cronbach's alpha of 0.884. The findings suggested that the difficult learning problems encountered by learners was to execute instructors' assignment without proper guidelines, while others found that the use of too many slides presentation and too wordy information presented by instructors were a hindrance to their classroom learning. Besides that, it was also discovered that all infographics features including the use of images and symbols, good design, attractive colors, concise texts and diagram, or chart could encourage learners to understand better with any learning information delivered through it. Finally, the acceptance of learners about infographics application in

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facilitating their learning sessions was most appreciated due to its high suitability to make information concise and coherent, it enhances creativity and productivity, and improves understanding and concentration in the learning session. Therefore, infographics should be promoted as one of the tools to ease learners' problems especially those that involve learners with tendency of having visual literacy skills.

Keywords Infographics • Visual learning • Information graphics

57.1 Introduction

Nowadays, the development of teaching and learning materials has become crucial for learners in every level of education. In almost every teaching and learning session, the instructors will use all the facilities and teaching tools provided to further enhance the learners' interest and understanding. The development of computer technology brings forth numerous applications and media for instructors to apply in their teaching session. Most of the instructors realized that they need to be in line with the fast-changing technology and to adapt to the positivism of technology in the classroom. The important aspects of technology in educational context should be emphasizing on the effectiveness of knowledge transfer from the instructors to the learners without abandoning the excitement of learning. Most of the technology used by the instructors nowadays is solely depending on computer applications such as Microsoft PowerPoint with multimedia elements applied on the slideshow to deliver knowledge to learners during learning sessions. What we are concerned about here is the implementation of slideshow as teaching tools can be at times expensive in terms of facilities and infrastructure requirements that exclude the need of instructors' skills and knowledge to use them. Some other issues pertaining to the use of slideshows are learners' attentions and understanding that are not solely based on how much animated and interactive the multimedia slideshow is in presenting the information to the learners.

Hence, infographics is introduced as a teaching tool to assist instructors in teaching and learning sessions to facilitate learners particularly in higher learning institution. Infographics is a combination of the words "information" and "graphics." It is defined as images that combine the data into a design, to facilitate individuals or organizations in spreading information to the audience concisely. Recent studies has pointed out that 75 % of information processed by the brain comes from the visual format [1]. This suggests that visual communication is a significant main support system to cognitive processes in solving complex problems and motivates learners to maintain excellence and sustainability. Infographics is viewed as a suitable medium as well as an effective tool not only for learners but also for instructors to ensure that learners will acquire accurate information that can be used in performing tasks. This can promote the widespread use of infographics for learners in higher learning institutions and could well bring in to the working environment too.

An infographics is a type of picture that blends data with design, helping individuals and organizations to concisely communicate messages to their audience. More formally, an infographics is defined as a visualization of data or ideas that tries to convey complex information to an audience in a manner that can be quickly consumed and easily understood. The process of developing and publishing infographics is called data visualization, information design, or information architecture [2]. Information graphics presents information by using graphical elements that are relevant to data, which may include charts, diagrams, graphs, tables, pictograms, and maps. As a visual tool, it presents useful information in a way that is easy to view. Communicating data using infographics has been used since prehistoric times.

Infographics research in the last decade has largely focused on the role graphics play as an attention-getting device, whether they aid recall and comprehension and whether they are used mainly to complement an article's content or to grab a reader's attention [3]. Previous research also found that infographics aid comprehension and recall [4]. The researchers demonstrated how infographics showed mastery of the concept and methods to extend the concept of real-world application for learners besides proving that infographics is the ideal tool of the twenty-first century to scaffold and support learning assessment among learners and instructors [5].

The study focused on the use of infographics as a tool for facilitating learning in higher learning institutions and the learners' acceptance of information or knowledge received through the learning process presented by instructors. Therefore, three objectives are outlined: to identify the issues that impede the learning process, to determine the most important features in infographics that can influence graphic design and digital media learners in learning, and to ensure learners' acceptance of the use of infographics as a tool for facilitating learning.

57.2 Methodology

Quantitative approach is used for this study, which requires information and data in the form of figures that can be measured. This research was conducted at a higher learning institution of Universiti Teknologi MARA (UiTM) Melaka. The target respondents are learners from the Department of Graphic Design and Digital Media under the Faculty of Art and Design. The study population involves learners in fourth (04) and fifth (05) semesters for the undergraduate program of graphic design and digital media. In order to achieve getting genuine feedback from respondents, descriptive quantitative study does not impose any treatment of the respondents and is measured only once. Descriptive study can provide findings that shaped the norm rather than the standard ones [6]. Therefore, this approach is used to get the latest scenario from the learners about the situation that they had faced in the learning session and to get direct feedback of their acceptance towards the use of infographics as a tool to facilitate learning.

57.3 Result and Discussion

There are 120 learners in total and they consist of 79 learners from 04 semester and 41 learners from 05 semester. In order to carry out the descriptive research, questionnaire is used for respondents. Respondents were selected through simple random sampling according to their classes and semester. Random sampling can avoid bias or favoritism, with all respondents having the same opportunities to provide information deemed to be true and accurate [7]. Besides that, the questionnaire is based on Likert scale; a score of 1 refers to "strongly disagree" and a score of 5 refers to "very strongly agree." A pilot test was conducted on 30 respondents among learners, and the results were obtained with the use of statistical package for data analysis to find the reliability of the items instrument by adopting Cronbach's alpha. Reference [8] has suggested that with a population of 120 learners, the appropriate sample for the respondents is 92 learners using small sampling approach. In this study, to ensure that the respondents and the collected data are well organized and valid, another extra 7 respondents has been selected and accumulated with the other 92 learners to make the total sample of 99 learners. The findings and data analysis was generated using IBM SPSS (Statistical Package for the Social Sciences) Statistics version 20 to describe in detail the answers of research questions as well as to achieve the objectives of the study. Likert scale was used to measure respondents' answers based on the different values of scores, and to achieve this mean score, every item that has been answered by the respondents was categorized into three different levels: "low," "moderate," and "high."

Formal permission was obtained before any engagement session with experts; this was held to ensure that the procedures are followed in order. The experts had evaluated each item in the questionnaire to ensure its conformity with the requirements of the research objectives as well as evaluating the aspects of infographics that are stated in the items to be forwarded to respondents. Based on the discussions and insights from the experts, the questionnaire has undergone improvements and minor changes to ensure it is parallel to what it has been designed to achieve the objectives of this study.

The Issues that Impede the Learning Process

As the overall mean score was M = 3.23 (SD = 0.82), 35.3 % of the respondents at the "high" level are having problems in the learning session, while 47.4 % of the respondents were at the "moderate" level. The result shows that learners are facing huge difficulty to produce the assignments that were given by their instructors without proper guidelines during the learning session. Furthermore, learners had stated that the learning sessions which focus on the use of wordy presentation slides to convey learning information has contributed to a certain level of difficulty for them to remain focused (Table 57.1).

Table 57.1 Issues that impede the learning process

No.	Learning issues Items	Mean	SD	Level
1	I find it difficult to understand too wordy information	3.19	1.03	Moderate
2	I find it difficult to maintain my focus of learning with many slides	3.33	0.98	Moderate
3	I find it difficult to understand the lecturer's explanation in the process of learning	2.99	1.10	Moderate
4	I find it difficult to ask question to the lecturer in the process of learning	3.03	1.10	Moderate
5	I find it difficult to execute lecturer's assignment without proper guidelines	3.59	0.96	High
	Overall	3.23	0.82	Moderate

Table 57.2 Learners' view of infographics features

No.	Infographics features Items	Mean	SD	Level
1	I tend to understand the information through visual/image/symbol	4.04	0.77	High
2	I tend to understand the information through a simple text	3.94	0.82	High
3	I tend to understand the information through a diagram/chart	3.60	0.89	High
4	I tend to understand the information with the use of attractive colors	3.97	0.81	High
5	I tend to understand the information with good design	4.04	0.81	High
	Overall	3.92	0.69	High

The Important Features in Infographics that Influence Learning

The findings have also proven that the features found in infographics indicated at the "high" level can influence the learners in the learning session based on the overall mean score of M = 3.92, SD = 0.69. A total of 72.8 % which includes 72 respondents were at the "high" level which emphasized the features available in infographics were accordance to the tendency of learners' acceptance for learning information, while another 26.2 % was at the level of "moderate." Based on the results, the respondents have stated that they were able to understand information communicated through the use of visual images or symbols with the implementation of good design (Table 57.2).

Learners' Acceptance of Infographics

Based on the respondents' feedback to determine their acceptance on the use of infographics as a tool to facilitate learning for learners, it was shown that the overall mean score for these items was 4.10 (SD = .69). A total of 80.9 % corresponding to

Table 57.3 Learners' acceptance of infographics

No.	The acceptance of infographics Items	Mean	SD	Level
1	Infographics is more suitable to be use during the teaching and learning session	4.07	0.75	High
2	Infographics can make information easier and simple	4.15	0.77	High
3	Infographics can increase my focus of learning	4.03	0.83	High
4	Infographics can improve my understanding of learning	4.08	0.77	High
5	Infographics can enhance my creativity to produce work effectively	4.13	0.77	High
	Overall	4.10	0.69	High

80 learners has given response indicating at the "high" level on the use of infographics for facilitating learning, while 18.1 % have responded at the "moderate" level and 1 respondent was at the "low" level. The results for each items stated were indicated at the "high" level which means the respondents found that infographics is highly suitable to be used for in facilitating their learning process (Table 57.3).

These learning issues reflect the role of instructors in conducting learning sessions that should emphasize on appropriate teaching approaches and strategies to be used for target learners; in this context, it refers to the graphic design and digital media learners. Instructors need to be the initiator and be responsive for every process that take place in a class by giving guidelines to the learners till they are able to find their own direction, and more efforts need to be put in to shape the understanding of the learners according to their ability [9]. The findings also showed that there were similarities with the previous studies regarding the use of a lot of text to convey particular information in a learning session which can cause learners' failure to understand properly the information or intended messages [10].

The use of Microsoft Office PowerPoint became a major obstacle to the learners to engage in learning actively; this is due to several factors, namely:

- The use of presentation slides prompted the instructors to elaborate more and longer to the learners as the instructors have to explain all the presentation slides for learners' convenience.
- Each time a presentation slide change to the next slide, the learners unconsciously do other things or divert their attentions to things they favored more which lead the teaching and learning session to lost focus.
- Presentation slides also prevent holistic thinking patterns among learners as well as hindered the exploration that connects between elements and information in the presentation [11].

The problem is closely associated to situations when the learners felt it is difficult to understand the information conveyed in wordy presentation slides causing them to face more difficulty when the instructors had to exhaustively explain to ensure that the learners understand. Once learners' momentum, motivation, and interest to explore in learning have been blocked due to the factors mentioned, they will increasingly become passive and learning sessions become monotonous [12].

Based on the findings of this study, infographics features as a whole are appropriate for learners with abilities and capabilities that vary across different types of learners. Therefore, the use of infographics is of great advantage when used systematically for visual learners who acquire and understand information through visual elements collectively found in infographics. Infographics features can be used as a tool of conveying information which facilitates presentation of complex data into a universally understandable visual presentation [13]. The use of visual elements in teaching and learning can bring positive results based on the rules and visual strategies used by instructors to maximize the impact effectively [14]. Learners as individuals who require knowledge stated that the use of visual elements as a teaching tool to deliver information can facilitate a more effective and quicker reception of information during the learning session. Infographics offer benefits among learners in the learning session: improving the quality of understanding information, ideas, and concepts delivered, increasing the length to maintain the information presented at the earlier sections, enhancing critical thinking skills, and developing and organizing ideas. The use of infographics to deliver learning information among learners also coincide with the visual learning theory especially true as visual communication serves as the main support system for cognitive process capability in solving complex problems as well as shaping the behavior and motivation of learners to excel [1].

As an intermediary medium which functions effectively in conveying information visually, infographics has features that consist of graphical and visual elements such as charts, images, diagrams, tables, pictograms, and maps in addition of simple and convenient text implementation to help the audience within the educational context to understand the information to be delivered. The relationship between infographics features and visual literacy ability among learners is crucial if the medium were used as a tool to facilitate learning. For instructors, the use of visual learning strategies and approaches that coincide is important in defining the effectiveness on the use of infographics. Instructors also need to understand the learners' ability in determining learning direction with the learning tools used so that the presentation of learning information can happen appropriately. Infographics is obviously suitable for visual learners who depended more to visual format to apprehend information clearly. Visual format is an educational tool that is not burdensome unlike other complicated and more difficult technologies, not only for learners but also for the instructors [15]. It is also stated that diversity in the use of visual images to convey a message or information can influence learners' comprehension [16].

57.4 Conclusion

Through the use of infographics as a tool for facilitating learning among graphic design and digital media learners, it is a medium which coincides with the needs of learners having great visual literacy in view of infographics' features that visual learners required. This study has proven that visual literacy is an important

component in determining the ability of the learners to accept the use of infographics as a tool for effective learning. In addition, a positive acceptance among learners of the features available in infographics can also help to resolve some of the problems faced by learners in the learning session. Excellent knowledge among learners associated with visual communication and the tendency of learners against graphic design thus become one of the most important factors in accepting infographics as a tool for facilitating learning.

Although the findings cannot be generalized to all levels and categories of the learners in various areas and other programs, however the results indicate that learners generally received positive use of infographics in the learning sessions. As the respondents of the study were selected from graphic design and digital media learners, who are generally more exposed to the use of visual and graphics elements, the encouragement of the use of infographics by instructors to facilitate teaching and learning session will foster the development of creative and innovative culture among learners. If instructors take into account the interest and advantages possessed by the target learners in relation to the most suitable method for delivering information, infographics is an appropriate tool to be used for learners in the relevant fields based on this research findings. Technological Pedagogical Content Knowledge (TPACK) has stated the importance for every instructor to have knowledge in terms of technology, pedagogy, and content knowledge so that every teaching and learning session with learners met the instructional objectives and learners' requirements [17]. Therefore, the findings in this study are essential to indicate to faculty and departments which are directly involved in producing skilled manpower in areas of creative industries to begin to get involved actively with using infographics as a platform for the teaching and learning in higher education institutions. Cooperation between every party is indispensable especially in the management level of faculties, departments, and instructors in improving the use of infographics to learners in the teaching and learning session. This will indirectly boost instructors' confidence in conveying learning information and fostering the use of information technology related to graphics among learners.

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Chapter 58
Measuring Organisational Culture Performance: The Preliminary Model

Nor Azlinda Mohamed Sabli and Siti Suhana Judi

Abstract Traditionally, the methods of investment such as payback method, net present value (NPV), cost-benefit analysis (CBA), return on investment (ROI) and internal rate of return are predominantly used to measure business performance. However, the key performance indicator (KPI) of business performance also includes other elements. Many studies have proved that the organisational culture within the workplace is strongly correlated to the business performance. Generally, an assessment of organisational culture is grouped into two categories: business objectives and organisational culture. In other words, the success of an organisation relies on how it is meeting its business objectives. This paper aims to introduce the preliminary model to measure the organisational culture performance. The model was produced through the blended effort of an expert opinion and comprehensive literature review with the intention to measure the capability of the organisation culture to achieve business objectives. The model consists of six levels of maturity; it describes the characteristics of each level to measure an organisational business performance from the culture perspective.

Keywords Organisational culture • Business performance • Business objectives • Proposed model

58.1 Introduction

Currently, there are various definitions of culture found in the literature. For example, culture is also defined as a collection of systems of representations, meanings, beliefs and other ideological variations among particular social groups [1]. From anthropology aspects, culture is the "complex whole which includes knowledge, beliefs, art, moral, law, custom and any other capabilities and habits

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acquired by man as a member of society. In order to achieve the business objective, it is essential for an organisation to measure its culture performance [2, 3]. Many studies indicate the importance to understand the organisation culture issues such as human relationship values and open system values in achieving business objectives [4, 5].

Organisational culture is also described as the aggregate of shared philosophies, assumptions, attitudes, expectations, norms and values that bind the organisation together [6], while others characterised organisational culture as "the pattern of shared values and beliefs that help individuals understand organisational functioning and thus provide them norms for behaviour in the organisation" [7]. From a business perspective, organisational culture comprises all corporate strategies, people, processes and structures [8]. Understanding and assessing organisation's culture can mean the difference between the success and failure in today's fast-changing business environment [9]. In order for the organisation to achieve its business objectives, there is an existing predetermined value, beliefs or characteristics as a collective mental programming within the organisation in which groups and individuals combine to get things done with additional conscious or unconscious elements [10] and identify culture as a "tool" management [11]. Organisational culture provides strong effects on the employee's performance and, ultimately, organisational effectiveness. It is predicted that reshaping cultural values would lead to change in the implementation success [12].

58.2 Problem Statement

Business challenges emerge due to business process re-engineering, enrichment of new technology and development, and unions of the organisation urge the organisation to change its organisational culture [13]. The tendency to achieve business objectives is relatively high with the right tools to measure organisational culture [14]. However, traditionally, the methods of investment measures based on productivity and process such as payback method, net present value (NPV), cost-benefit analysis (CBA), return on investment (ROI) and internal rate of return are predominantly used to measure business performance. Moreover, there have been little studies to address the characteristics and categories of culture as objective performance measures in the literature [15]. Therefore, this paper presents the preliminary model to measure organisational culture with the link to achieve business objectives.

58.3 The Proposed Preliminary Model

For each maturity stage, the model describes a set of six characteristics that must be in place for the company to achieve each stage.

Business Plan

The purpose of the business plan is to define the business and explain in as much detail as possible how the venture will operate in the current market [16]. A business plan also communicates goals throughout the organisation and helps the organisation stay focused on its objectives. The organisation can use the plan as a benchmark to identify both achievements of goals and areas that need improvements [17].

Staff Employment

One issue that frequently arises in an organisation is how to identify the right person for a job or assignment. Many authors indicate the significance of the employee's attributes such as individual attitudes and behaviour to the performance of organisation towards achieving business objectives [18]. The organisation can gain additional competitive advantage through comprehensive employment strategy and an alignment between individual goals and organisational goals [19].

Knowledge Sharing

Knowledge is created within individuals or is intrinsically present in organisational members in highly specialised ways [20]. In effect, individuals have the knowledge upon which the organisation depends as these employees create, develop and possess that knowledge which sustains and advances the organisation. Knowledge management methods are typically deployed to identify the best practices and subject matter experts within the organisation [21] and as a means to develop organisational intellectual capital [22] while maximising knowledge that aligns and supports the organisation's mission and strategic vision [23]. These practices can improve work efficiencies while maximising organisational performance [24]. The success of knowledge management and the effectiveness of knowledge sharing in organisations are predominately associated with organisational culture.

Decision-Making

Culture has a great impact on the organisation thinking and decision-making [25]. A high-quality decision is one in which the action chosen is consistent with the objectives of the organisation and with potentially available information about the probabilities of action leading to the attainment of these objectives [26]. Implementation of the decision is influenced by the degree of support from the members in the organisation.

Business Process

A business process is the combination of a set of activities within an enterprise with a structure describing their logical order and dependence whose objective is to produce a desired result [27]. Business process is present in all process areas or phases that provide structure and define the particular areas an organisation should focus on in the implementation of successful business improvement initiatives [28]. The ability for business process management to permeate the organisation and drive value to multiple areas of the business is heavily dependent upon organisational culture [29]. Moreover, culture is referred to as a source of failure or success in business process management initiatives [28].

Communication Plan

Communication is seen as a social process within a context, in which signs are produced and transmitted and then perceived and treated as messages from which meaning can be inferred. Every culture expresses its purposes and conducts its affairs through the medium of communication [30]. The rapid changes in communication and distribution of messages are affecting the values, knowledge and norms of cultures. The validity of the proposed model will be tested by a few case studies. Figure 58.1 describes the proposed model (Table 58.1).

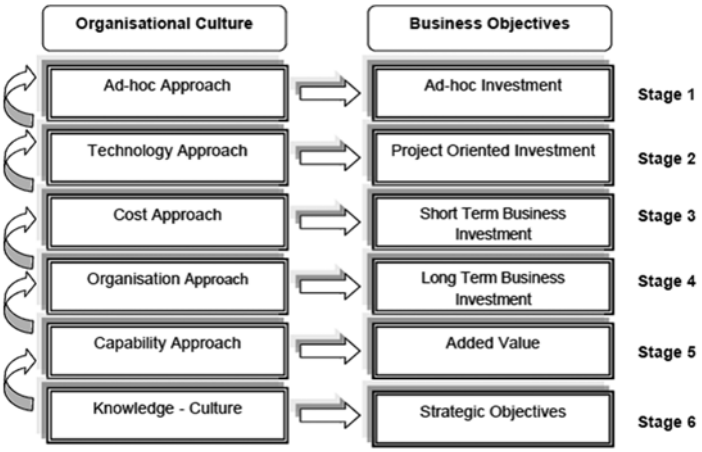

Fig. 58.1 Proposed culture model

Table 58.1 Stage characteristics of evaluation element

Stage/attribute	Business plan	Staff employment	Knowledge sharing
Stage 1 *Ad hoc approach – ad hoc investment*	Ad hoc business plan and stand alone	Based on current needs and perform all most all operations	Does not exist
Stage 2 *Technology approach – technology oriented investment*	Based on technology and how organisation has to fit into technology	Based on individual skills to operate assigned technology	Exists between specific areas
Stage 3 *Cost approach – short term business investment*	Taking into consideration cost and benefit analysis and the impracticable business plan thrashed out	Based on performance and contributions towards multitasking	Exists between business and technical knowledge
Stage 4 *Organisation approach – long term business investment*	Taking into consideration staff opinion	Based on the needs of the organisation	Freely shared between organisations
Stage 5 *Capability approach – added value*	Add value to the current product and services offered	Based on specific skills, decentralized staff management with central coordination control	Knowledge shared among staff with proper knowledge management system
Stage 6 *Knowledge – culture and strategic objectives*	Collaboration with other organisations	Exchange staff with other organisations	Knowledge sharing between organisations

58.4 Conclusion

The model was produced through the blended effort of an expert opinion and comprehensive literature review with the intention to measure the capability of the organisation culture to achieve business objectives. The model consists of six levels of maturity; it describes the characteristics of each level to measure an organisational business performance from the culture perspective. The preliminary model will be validated by a few case studies in distinctive form of empirical inquiry and exploratory investigation. The model also has been proposed as a generic model which is applicable across industries; however, it is recommended that an expert in that particular industry who has better knowledge and understanding for detailed investigation identify the precise and specific requirements needed.

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Chapter 59
To Innovate the Potential Use of Arc and Oxyacetylene Gas Welding Tools as an Alternative Technique to the Expensive Foundry Works in Creating Metal Casting Sculpture

Mohd Razif Mohd Rathi, Mursyidah Zainal Abidin, and Zaidi Wasli

Abstract This research is to innovate the potential use of arc and oxyacetylene gas welding tools as an alternative technique to the expensive foundry works in creating metal casting sculpture. The arc and oxyacetylene gas welding tools are commonly used by welder limited to jointing works. However, the researcher believes that the melting capabilities of the arc and oxyacetylene can be harnessed and be used to create other creative products. This research focuses on fabricating three types of metal copper and brass on mild steel structure to form layers of "surface skin" in replace of foundry work treatment (casting work). This process offsets or replaces the expensiveness of foundry work. When applied to the production of creative work, this process produced very rich tactile textures that complement the design. The flexibility of the process or technique is easily adopted by experienced welder and sculptor, and as such it will be an added value to their profession and to commercialize their product.

Keywords Sculpture • Welding • Foundry • Innovate • Alternative

59.1 Introduction

According to Herbert Read in his book *Modern Sculpture*, metals in general have certain unique qualities, e.g., they can be ductile, which means that they can be drawn out into wires; they are malleable, which means that they can be shaped into form by hammering; and they can be melted and cast, molded into predetermined shapes, or pressed. As modern sculptors, they must take advantage of these qualities

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and explore other possibilities, for example, the use of wire by Picasso, Calder, Cricket, Butler, Lassa, David Smith, and many others; use of welded sheet iron by Larder, Jacobsen, Cesar, and Muller; use of wrought iron or steel; and many combinations and variations of these techniques [5].

As far as technique in producing metal sculpture is concerned, there must be a technique and machine that can help the sculptors to realize their ideas. Another technique besides welding using metal is lost wax casting technique that allows a sculptor to transfer an object or duplicate it in an almost perfect shape. This technique had to deal with foundry and the process is very labor intensive. The process is much more expensive in a way of production and is not a popular choice of technique among sculptors to produce their sculpture. The cost of materials is also a big factor, especially as the cost of bronze has skyrocketed over the past few years. Most bronze used in fine art casting is silicon bronze, 95 % copper, 4 % silicon, and 1 % manganese (an alternative formula is 92-4-4). The price of copper has risen 500 % in just a few years from a low of near $.75 to around $3.50/lb currently (http://www.petebow-ieart.com/index.htm) [6]. With this factor, there must be an alternative in producing a metal sculpture, especially when they want to create a portrait bust sculpture or any organic and geometric subject that does not depend on foundry process and also does not have higher cost of production. By using affordable and economic methods that already exist is possible for almost all the sculptors in producing metal sculpture.

59.2 Sculpture Terminology

Welding is a fabrication process that joins materials, usually metals or thermoplastics, by coalescence. Many different energy sources can be used for welding. They are gas flame, electric arc, laser, electron beam, friction, and ultrasound. Arc welding and oxyacetylene gas welding are the most popular methods to use in the industrial and the art field.

Arc welding uses a power supply to create and maintain an electric arc between an electrode and the base material to melt metals at the welding point [1]. In 1800, Sir Humphry Davy discovered the electric arc. Advances in arc welding continued with the invention of metal electrodes by Nikolay Slavyanov and C. L. Coffin, amid the increasing popularity of carbon arc welding which involves carbon electrodes [5].

Meanwhile, acetylene was discovered in 1836 by Edmund Davy, but its use was not practical in welding until about 1900, when a suitable blowtorch was developed. It was one of the most popular welding methods due to its portability and relatively low cost. Oxyacetylene is also one of the oldest and most versatile welding processes, but in recent years it has become less popular in industrial applications. Lenton Parr, one of the earliest sculptors to use steel as a material in Australia, started on the aforementioned metal when he returned from a working stint in England. He introduced oxyacetylene gas welding into the Sculpture Department of Royal Melbourne Institute of Technology in 1957, where the technique later became a way to assemble steels by a sculptor.

From the early nineteenth century, artists commonly use welding to produce sculptures. They were Julio Gonzalez with his sculpture title “Torso,” Ibram Lassaw with

"Procession," and other early sculptors. Today, sculptors produce various kinds of welded sculptures using different techniques and materials. The welding machines that are commonly used among the sculptors are arc welding and oxyacetylene gas welding.

David Smith (1952) explained that welding made this technically possible, by permitting the artist to fabricate his pieces quickly and to work with an improvisational manner [5]. He could experiment with forms and remove or alter them at will. "I do not work with a conscious and specific conviction about the piece of sculpture," he explained in 1952. "It's always open to change a new association. It should be a celebration, one of surprise, not one rehearsed." He even saw the materials themselves as emblematic of masculinity and of the machine and of the machine age. The metal itself possesses association of century, power, structure, movement, progress, suspension, and brutality, and he felt that art had to engage this language of the machine in order to express an authentic experience of that present.

In Malaysia, one of the artists who practically use this particular welding is Anthony Lau. He used welding technique to assemble his sculpture "Forest" (1968) [3]. He achieved an understanding of the technique through his respect and concern on the material and claimed that he always has an attraction with materials. Steel is a material commonly used by sculptors in Malaysia to produce their sculpture. Sculptors such as Zulkifli Yusoff, Ramlan Abdullah, and Raja Shahriman use steel as their material, and indeed, they have to use welding machines in their assembling processes.

Since the late 1990s, Malaysian sculptors have been taking and manifesting forms and symbols from their environment or at least inculcate aesthetics within it, where sometimes it acts as a symbolic turning point from the past and the future (Ramlan Abdullah, Catalogue Contemporary Metal Exhibition) [4]. Furthermore, the usage of materials in producing sculpture especially steel as a conventional material had its own sense of regionalism from the art itself. In the process of making, manipulating, and presenting it, machines such as arc welding and oxyacetylene gas welding are used with the purpose of assembling the visual appearance of the steel sculpture. Ideas with steel are translated through the capabilities and possibilities that come from the full usage of the machine itself.

From the contemporary metal exhibition, a simple survey was made on the use of conventional and solid waste materials by sculptors and the process of making, manipulating, and presenting them. The objectives include to understand material usage in sculpture and the question of medium as interaction/communication and to understand material selection and justification in terms of surface appearance, texture, color, character, durability, and practicality in sculpture making (Ramlan Abdullah, Catalogue Contemporary Metal Exhibition) [4].

> The artist had to respect their materials. [2]

The researcher is compelled to do an experimental research, where the arc welding and oxyacetylene gas welding machines will be used in experiments with three different types of steel to create sculptural forms. Potentials and results would be discovered from these experiments.

The objective of this research is to determine the potential of the arc welding and oxyacetylene gas welding as a melting tool by melting scrap mild steel, brass, and copper in producing a sculptural form, an alternative to foundry work.

The reason the researcher chooses copper, brass, and mild steel in this experiment is because of the differences of the color effects and also the potential results that these three types of metals would achieve during the experiment. Although there would be different points of melting among the three metals, the experiment would take that into account as one of the possibilities. The research also had to deal with metallurgical studies that involve a scientific research with metal.

59.3 Methodology

In this research, the researcher used two types of welding machines with different melting capabilities, using three different types of steel in creating a sculptural form. The focus and concern in this research is to see the potentiality of the combination and mixture as a result to be an alternative for foundry work in creating a sculptural form.

The experimental research will first allow the determination of the potential of the welding machine (arc welding and oxyacetylene gas welding) as a melting tool and use the potentiality of the machine itself to be an alternative way for producing foundry sculpture. This research determined several investigations involving metal as a primary material and firing temperature as a melting component. Types of metal that have been used for experimentation are mild steel, brass, and copper. There are 5 forms of structure used in preparing the experiment on combining the 3 metals. All the structures are made from mild steel in a form of flat mild steel plate, curved mild steel plate, flat mild steel rod, and curved mild steel rod and in form of vertical and horizontal composition with mild steel rod. The entire surface structure was constructed with arc welding because it is easy to handle and takes less time in producing armature.

The process of brazing using oxyacetylene gas welding involves brass and copper to form layers of the "surface skin" which had to deal with different melting points on each metal. Every single structure covered by beads of melting brass and copper will be ground by using the grinding machine to experiment on the different appearances between unfinished surfaces with new machine surface.

59.4 Experimental

Based on the findings, this experiment leads to the result on the actual body of work. From the findings, this experiment requires an actual sculpture making through the basic process such as sketching, modeling, creating armature, constructing, reconstructing, and finishing. By using an organic form as a subject to execute the process, the researcher chooses to create a portrait bust sculpture in this experiment.

In this sculpture, the use of different types of steel made the conventional portrait bust sculpture become more interesting. Each type of metal use in this sculpture has been combined on one structure. The structure or armature contributes an important role in fabricating these pieces. The surfaces were highly polished to create a casting quality. By using this technique, the appearances of the sculpture turn out to be the same as the

foundry casting. As a conclusion, the result combined a meticulous approach that is related to the skill of the sculptor with the technique from the experiment. This technique produced very rich and tactile surfaces due to the use of different types of steel.

Furthermore, based on the result it proved that the structure constructed by using scrap metal can reduce a fabrication cost for sculptors. Finally, the researcher believes that the advantage of this process is that it can offset or replace the expensive production of foundry work in producing metal casting sculpture; please refer to Figs. 59.1 and 59.2).

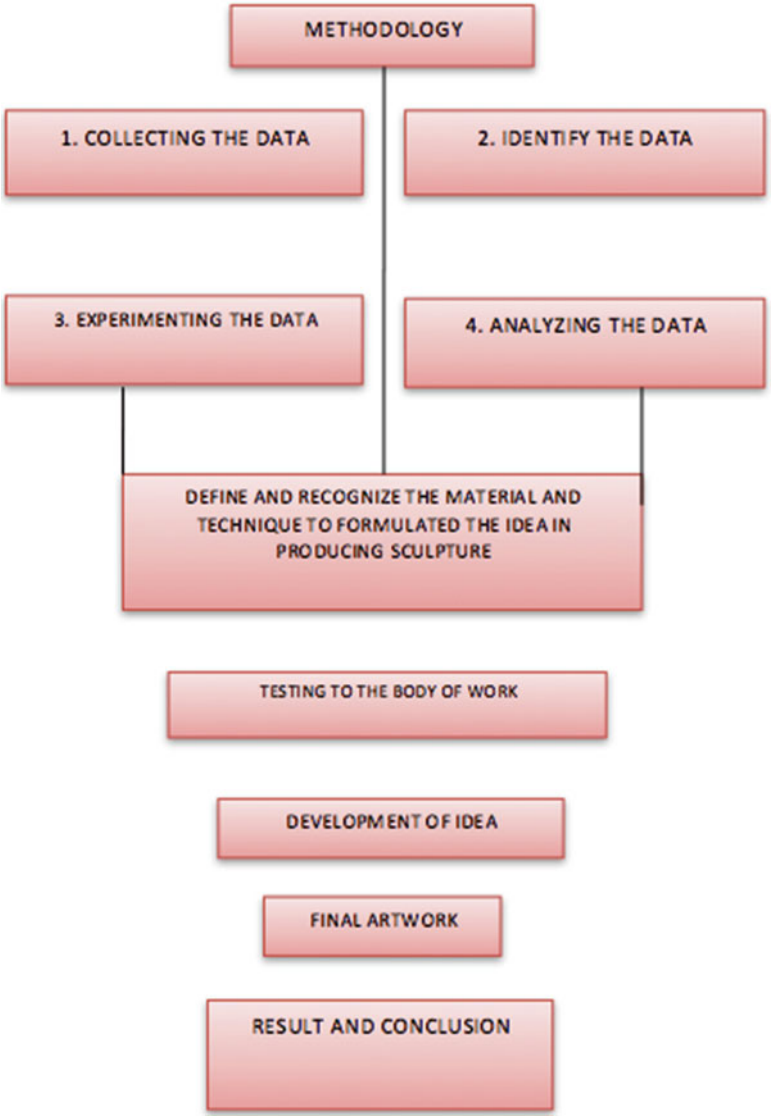

Fig. 59.1 Research framework and methodology

Fig. 59.2 Final artwork comparison between inner and outer surface

59.5 Conclusion

After undergoing this research about the potential of arc and oxyacetylene gas welding, the researcher can conclude that the use of this technique can be an alternative to the expensive foundry work in creating metal casting sculpture. The result on the rich surface produced by this process can be an added value for sculptors in creating their metal sculpture. Furthermore, the result combined a meticulous approach that is related to the skill of the sculptor with the technique from the experiment. This technique produced very rich and tactile surfaces due to the use of different types of steel. Hence, the outcome of this research will change welding tools from passive instruments to dynamic innovative tools, to the sculptor, art student, and practicing artist toward the production of metal-based sculpture. The process is easily adopted in sculptural making. It produces very rich tactile textures that complement the design work.

Acknowledgment Praise to the Almighty Allah for His blessing, for this research was successfully completed within the time scheduled allotted. We wish to express our deepest gratitude to our adviser, Associate Professor Ponirin Amin, for his patient guidance, unfailing support, and encouragement throughout this long, challenging process to produce the research that was at first nothing from the start. We also like to express our gratefulness to the members of our committee for their guides and support. Special thanks to our family for their patience, understanding, and encouragement. Alhamdulillah, we have to be thankful again to Allah S.W.T. for allowing us to live and being able to appreciate the art of life.

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Chapter 60
The Behavior Patterns Toward Printed Color Medium for Students with Hearing Disabilities

Farrah Hanani Ahmad Fauzi, Fazlina Jaafar, Wan Nor Raihan Wan Ramli, and Azian Mohd Zain

Abstract The students with impaired hearing often have low self-esteem to communicate with the public. The main effect causes delay in the development of receptive and expressive communication skills on their speech and language. They have difficulty in understanding the complex writing system such as the relative clause. This leads to communication problems with others. Based on the findings by Pamela Irene Mary Protheroe from Victoria University of Wellington [1], students with impaired hearing typically have stronger visual skills compared to verbal skills in communication by using sign language. This research will develop new and exciting teaching kit information and support the existing curriculum for the students with impaired hearing in achieving the expected level of learning in the future. Of the many subjects in the primary school, the researcher chose the Bahasa Melayu subject in the KBSM curriculum. This paper highlights the key issues in exploring and experimenting the new changes in illustration, from the old conventional black and white to the enjoyable expressive color illustration by implementing cartoon characters. The new media will develop a new idea from conception and apply it to a physical digital design development. The researcher intends to find a novel approach to reconstruct the existing textbook by using cartoon characters. This produced a prototype that yielded a positive and new engaging learning experience for students with impaired hearing, which was due to succeed and can help the students with impaired hearing to raise their confidence level to communicate with others.

Keywords Impaired hearing • Printed color medium • Teaching kit • Visual communication

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60.1 Introduction

The students with impaired hearing have difficulties in understanding and producing short and basic sentences compared to the normal children. These problems will lead them to misunderstanding and misuse of verb tense, pluralization, verb, and possessive words. In addition, the language deficit will also cause their learning process to reduce, and this will affect their academic achievements. They seek to combine personal expressions to convey ideas and messages to communicate.

The National Association of the Deaf had determined progress among students with hearing impairment using the digital vector expressive illustration. The use of digital vector illustration can be one of the approaches that can create an enjoyable feeling for students with impaired hearing in their reading process. Of the many subjects in the primary school, the researcher chose the Bahasa Melayu subject in the KBSM curriculum. The students with impaired hearing typically have stronger visual compared to verbal skills in communication by using sign language. This paper highlights the key issues in exploring and experimenting the changes in illustration, from the old conventional black and white to the enjoyable expressive color illustration by implementing cartoon characters. This research will develop new and exciting teaching kit information and support the existing curriculum for the students with impaired hearing in achieving the expected level of learning in the future. It aims to make a positive contribution to reducing the barriers of low self-esteem for the students with impaired hearing. As part of this research, it will increase the knowledge and understanding of the behavior patterns toward students with impaired hearing. It will possibly create and engage a more attractive and faster response in the students's learning sessions. Based on the study by the American Academy of Pediatrics (AAP) and the American Academy of Child and Adolescent Psychiatry (AACAP) [2], cartoon characters do influence the behavior of children [2]. The researcher wanted to develop the new approach for the textbook using cartoon characters. The researchers selected three types of cartoons and developed an attractive image for the new design for Bahasa Melayu textbook for these students. The elements of an effective design strategy include the prototype research vision that had been developed by the researcher. It will stimulate these children's emotion in understanding sentences by reading. The old illustrations and descriptions of paragraph applied in the existing Bahasa Melayu textbook are not interesting and connected to each other. The researcher took the ideas from conception and applies it to a physical digital color design development [3]. The researchers intend to find a precocious approach to reconstruct the existing textbook using cartoon characters. This produced a prototype that was due to succeed and can help the students with impaired hearing in academic achievements. Digital illustration will serve as an important communication visual tool in the learning process that can raise their confidence level in building sentences in order to communicate in the future.

60.2 Methods

This research will integrate qualitative methods. Qualitative research is highly contextual, and the data that are being collected in a natural real-life setting can show how and why things happen. The researcher has chosen this method to understand the respondent's actions and behavior toward printed color medium by using cartoon characters. The researcher has also used a variety of methods to collect the data such as taking photo, video recording, focus group interview, and an open-ended questionnaire. This prototype will be designed as a learning kit to create an enjoyable learning process by using printed color material rather than using the current black and white approach in the Bahasa Melayu subject in the KBSM curriculum. In order to obtain data for the data collection, the observation and focus group interview approach will be used to assist the coaching process of understanding sentences in the class. These observations and focus group interview will be conducted in the year three primary school children with hearing impairment. The illustrations existing in the Bahasa Melayu textbook are only black and white. The old method that been used had caused the impaired students to feel bored in the classroom. Moreover, the pictures that had been used in the textbook do not explain all the words in the whole sentences. Therefore, the researcher had to do some processing to transform the old conventional black and white illustration approach from the Bahasa Melayu textbook into the new digital vector color illustration approach. The researcher will develop new enjoyable expressive color illustration by using cartoon characters (Fig. 60.1).

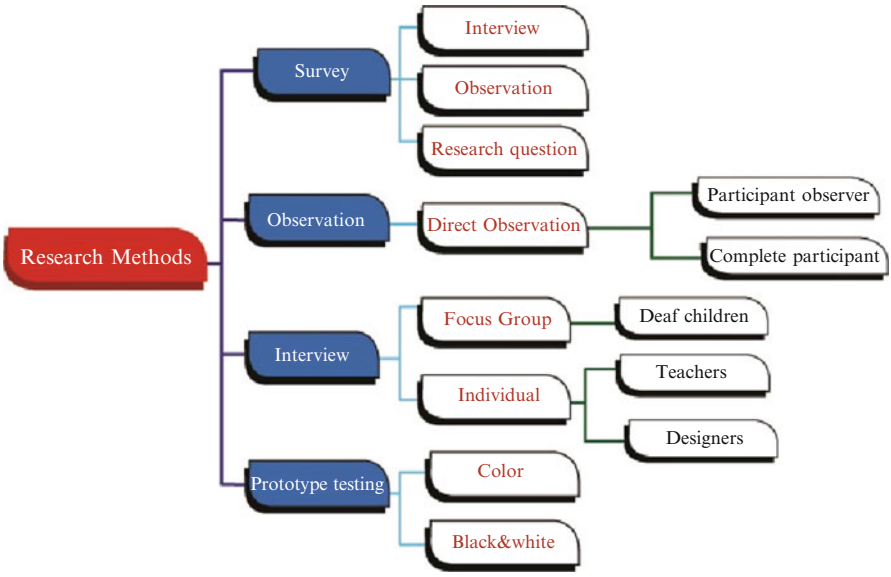

Fig. 60.1 The research design method

60.3 Result and Discussion

The use of digital color illustration has a very strong potential in the learning session. The uses of black and white illustration in the existing KBSM textbooks are not interesting. The illustration on the KBSM Bahasa Melayu textbook was not focused on the consistency of the sentences with the pictures. Furthermore, using images with different colors can improve the hearing-impaired students's understanding compared to using text alone. The main problem faced by the impaired students is the lack of suitable reading materials provided for them to improve their reading skills. The findings from this research might be adapted directly in understanding the behavior of students with hearing impairment towards learning sentences in class.

Example of Figures

Please refer to Figs. 60.2, 60.3, 60.4, 60.5, 60.6, 60.7, 60.8, and 60.9.

Focus Group Interview

Based on the findings, it has been proven that the image concept taught to the students with impaired hearing can improve the students will give faster response. They cannot manipulate and transform information in logical ways, but they now

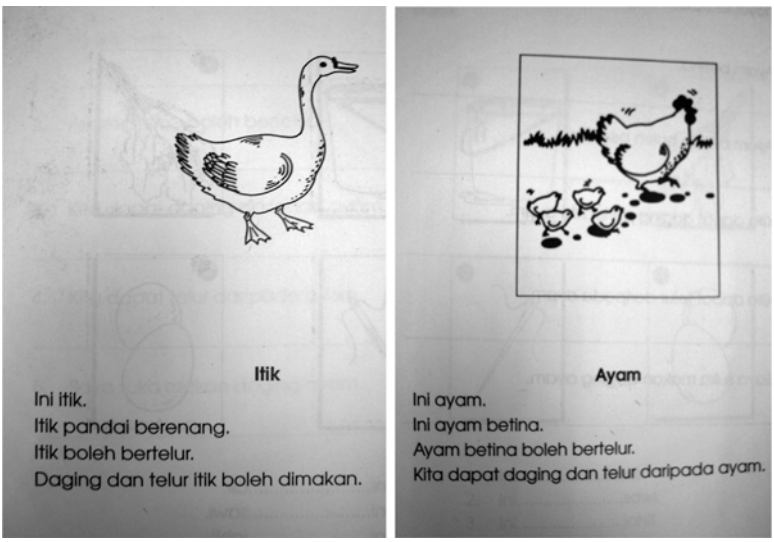

Fig. 60.2 Example of old illustration applied in the KBSM textbook especially for students with impaired hearing

Fig. 60.3 Example of sketches of idea development for cartoon character done by researcher

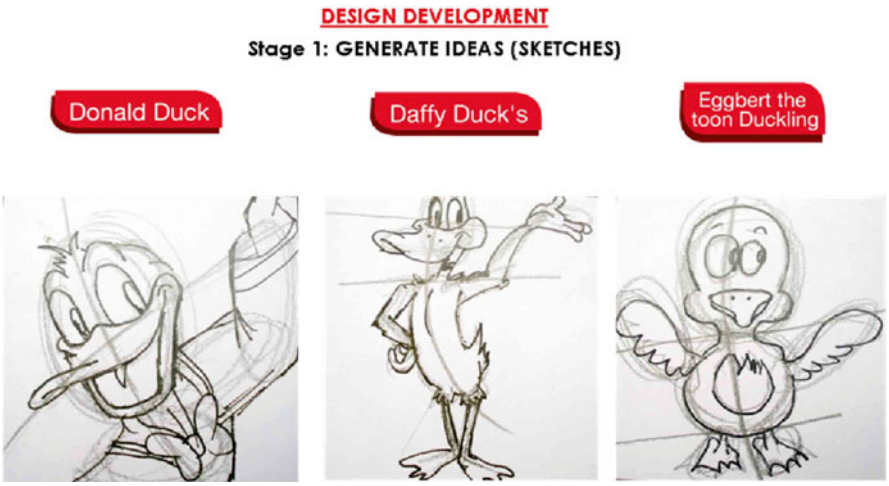

Fig. 60.4 Sample of new cartoon character development for chicken and duck

Fig. 60.5 Sample of new cartoon character development for duck

Fig. 60.6 Sample of new cartoon character development for chicken

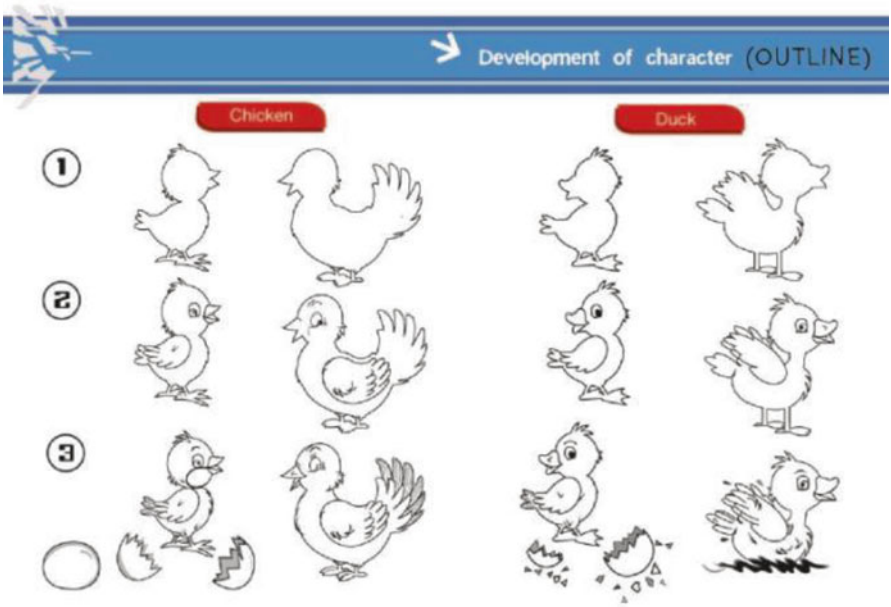

Fig. 60.7 Example of digital development of character by researcher

can think using images and symbols. The researcher also had developed the appropriate open-ended questions as the evidence toward the research that had been conducted. The researcher had taken pictures and had recorded all of the research using video recording to understand the hearing-impaired students's behavior in class. The interview session went smoothly even though the teacher became the interpreter for researcher to communicate with the hearing-impaired students. This particular method was also supported by Piaget [4], when he recorded that the development progress of the children is based on the children's cognitive development studies. Piaget considered that children primarily learn through the buildup of

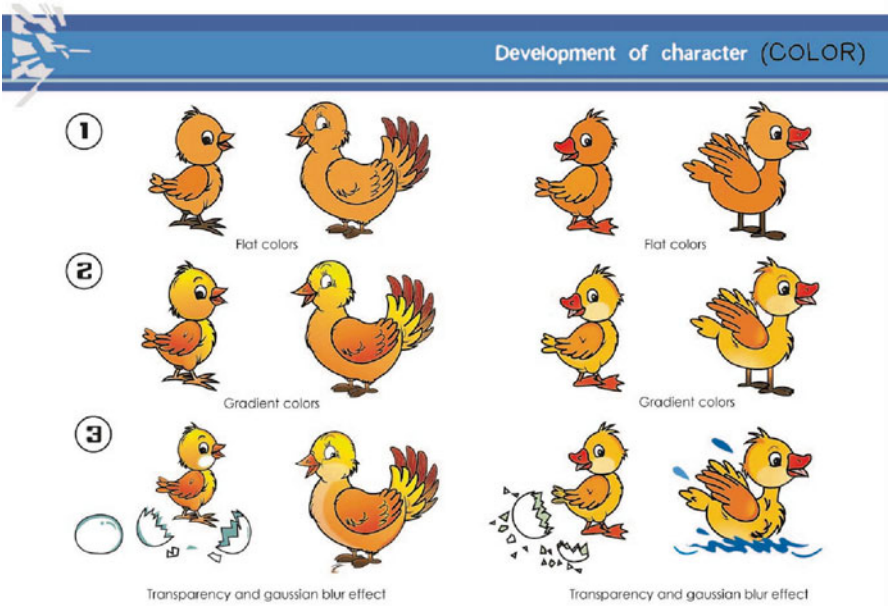

Fig. 60.8 Sample of expressive digital color illustration

Fig. 60.9 The new design layout applied in the KBSM textbook for students with impaired hearing

symbolic images compared to text approaches. The prototype will be designed as new teaching kits that create an enjoyable learning process [5]. The new printed color media are more attractive and engaging new learning experience for these children.

Observations

Research has been done by using short-term qualitative method on recorded observation. The prototype will only be tested for the year three primary students with impaired hearing. Direct observation method has been developed with the objective of observing children in their natural behavior. All of the natural behavior had been captured and recorded using video recording. The testing prototype design session was conducted in four different sessions to establish the readability for summative evaluation purpose.

Interview Session

In this research, the teachers and students were complete participants. The teachers and students gave full commitment in helping the researcher to try the effectiveness of the prototype that had been designed. The teachers conducted the learning session as usual. But in this research session, the researcher had tried to use a different approach. Two sessions involved the use of black and white illustrations, while the other two sessions involved the use of colored illustrations. The interview will lead the researcher to investigate the social situation of the group for the research. By participating during the research interview session, the researcher will have a clearer understanding of the behavior pattern toward printed color media that use digital vector illustration with cartoon characters.

60.4 Conclusion

A key issue in this research is exploring and experimenting the use of digital vector color illustration as an important medium to help students with impaired hearing in their learning process of understanding sentences. The use of colors has been proven to effectively support the human performance in visual information processing. Furthermore, color can improve the hearing-impaired students's understanding by using images combined with colors compared to using text alone [6]. The students with impaired hearing find it difficult to recall details of sentences in reading by using black and white illustration. They are good at visual word recognition and can read passages correctly, but have more difficulty in understanding the text. The

memory skills of students with impaired hearing are more delayed compared to the children with normal hearing. The students with impaired hearing typically have stronger visual than verbal skills. They need sensitive support to help them understand what they read. The implementations of cartoon characters are considered as a tool for visual literacy in the learning process through vision of actions. Cartoons may possibly serve as an alternative way to stimulate hearing-impaired students's emotion in understanding sentences by reading. Cartoon characters have been identified as a tool that may attract their attention in class. Based on the research done by Ellen Hoadley, Ph.D., from Loyola College, Maryland, USA, color can increase the learning and retention in studies by 78 % [7]. On the other hand, color has an important role to convey visual message on psychological and emotional levels. The use of images with color has proven to increase the students's interest in the learning process. Therefore, this research key issue will explore and experiment the new teaching kit information and support existing curriculum. This research will possibly create and engage a more attractive and faster response for the students in their learning sessions by using the right design layout [8]. This research will contribute to the provision of new effective teaching kit approach for students with impaired hearing. This prototype yielded a positive contribution and will engage faster response in their learning sessions.

Acknowledgment The author would like to acknowledge those who helped us complete this research, especially the entire team members for their invaluable assistance and insights and the University Technology MARA (UiTM) for their financial support under the Excellent Fund Scheme.

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Chapter 61
Vision 2020 Banknotes Revisited: A Semiotic Analysis of the Third Series of Malaysian Banknotes

Mohamed Razeef Abdul Razak, Azahar Harun, and Dzul Haimi Md. Zain

Abstract In 1996, Bank Negara Malaysia (BNM) introduced the third series of banknote which is intended to distribute awareness regarding a strategic economic transformation plan called Wawasan 2020 or Vision 2020. This particular banknote mainly contains several illustrations featuring tourist destinations, famous landmarks, telecommunication apparatus, modern transportation vehicles, oil and gas activities, and industrial plants. Hence, it is argued here that these illustrations do not only add aesthetic value to the overall banknote design but can be regarded as visual codes that contain hidden meaning. In light of this matter, this study sets out to examine the third series of banknote with the aim to assess its visual codes in terms of how effective they are in communicating the meaning of Vision 2020. In order to conduct this study, a semiotic analysis method introduced by Charles S. Pierce was employed. This method involves analyzing the visual codes (text, graphic, and illustration/image) featured in the third series of banknotes. Based on the findings, the researchers conclude that all of the visual codes portrayed in the third series of banknotes do not only promote Vision 2020 but also symbolize the former prime minister, Tun Dr. Mahathir Mohamad, who is the architect behind the strategic plan.

Keywords Malaysian banknotes • Vision 2020 • Semiotic analysis

61.1 Introduction

Banknote is a work of art traded every second worldwide. Typically, the visuals depicted on the surface of the banknotes are not just for decorative purposes but also functional. Therefore, they should be regarded as visual codes which communicate,

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educate, inform, and promote national aspiration. According to Robert T. Schatz and Howard Lavine [11], national symbols are powerful visual codes that possess the capability of "evoking emotional expression of national identification, allegiance, and self-sacrifice" [11]. Hence many experts in visual communication perceive banknote as an authoritative propaganda. The purpose of this study is to examine the third series of banknote with the aim to assess its visual codes in terms of how effective they are in communicating the meaning of Vision 2020 (the theme of the third series of Malaysian banknotes).

Vision 2020

The "Vision 2020" is actually a strategic economic transformation plan which was introduced by the former Malaysian prime minister, Tun Dr. Mahathir Mohamed, on February 28, 1991, at the launch of the Malaysia Business Council. On this occasion he presented a paper entitled "Malaysia – The Way Forward" [7], which offers new ideas and insights about the future development of Malaysia into a truly developed country by the year 2020.

According to Tun Dr. Mahathir [7], there are nine challenges that need to be achieved in order for Malaysia to be a developed country [7]. The nine challenges of Vision 2020 are:

1. Establishing a united Malaysian nation made up of one Bangsa Malaysia (Malaysian Race)
2. Creating a psychologically liberated, secure, and developed Malaysian society
3. Fostering and developing a mature democratic society
4. Establishing a fully moral and ethical society
5. Establishing a mature liberal and tolerant society
6. Establishing a scientific and progressive society
7. Establishing a fully caring society
8. Ensuring an economically just society, in which there is a fair and equitable distribution of wealth of the nation
9. Establishing a prosperous society with an economy that is fully competitive, dynamic, robust, and resilient

A Brief History of Malaysian Banknotes

The first series of Malaysian banknotes were issued in 1967 by BNM with the geometric concept, which introduced the portrait of the first Yang Di-Pertuan Agong on the right side of the front banknote. The back of the banknotes features the traditional design of "Kijang Mas," an official logo of BNM [9]. The second series of Malaysian banknotes was introduced in 1982 with a different theme and design but

maintained the portrait of the first Yang di-Pertuan Agong and BNM logo [15]. With the theme "Artifacts and Culture," the banknotes featured traditional ornamental design with national heritage culture in the front and back of the banknotes [14]. The reverse of these notes features some of the important landmarks and buildings.

The third series of Malaysian banknotes was issued on 1996 and carries the theme of Vision 2020, which reflects Malaysia's aspiration to become a fully developed country by the year 2020. Also maintained was the portrait of the first Yang Di-Pertuan Agong and BNM logo, but the design looks fresh and modern with minimalist design approach. The reverse design features images that suggest the concept of Vision 2020. These images are "tourism" in RM1, "telecommunication" in RM2, "transportations" in RM10, "oil and gas" in RM50, and "car production" in RM100 (Fig. 61.1).

Methodology

In *Media Analysis Techniques*, Arthur Asa Berger [2] states that semiotic analysis is an approach that concerns the interpretation of sign and its latent meaning [2]. Since visual is also a sign that carries meaning, thus semiotic analysis can be applied to anything, in particular those that "involves or are concerned with communication and the transfer of information" (p. 5). In order to appreciate the science of

Fig. 61.1 The third series of Malaysian banknotes with a theme of vision 2020

semiotics, Berger acknowledges two well-known pioneers of semiotics. They are Swiss linguist, Ferdinand de Saussure (1857–1913), and American philosopher, Charles Sander Pierce (1839–1914). In general, Saussure and Pierce argue that semiotics is essential for humans and is widely used in communication. For example, in religion, the symbols of a crescent and a star are associated with Islam.

Despite their similar views, both scholars actually have different techniques in defining a sign. In *Semiotics: The Basics*, Daniel Chandler [4] states that Saussure puts emphasis on two divisions of sign, that is, signifier (sound or image) and signified (concept) [4]. Saussure states that these two divisions cannot be separated but depend on each other in order to form meaning. In this sense, the signifier is considered the primary meaning, while the signified is the secondary meaning. Pierce, on the other hand, offers three elements that make up a sign, which includes "the representamen," "an interpretant," and "an object." Chandler notes: "The Representamen concerns the form which the sign takes; An Interpretent is the sense that made the sign; An Object is something beyond the sign to which it refers" ([5], p. 29). Thus, the interrelationship of these elements allows viewers to make sense of the sign and possibly gain benefit from it.

In this study, the researchers employed Pierce's semiotic analysis method based on a reason that it encompasses a much broader range of signs, including language as well as nonverbal and natural signs as compared to Saussure's approach which has only two layers of meaning (signifier and signified). In order to perform the semiotic analysis, a task called deconstruction and reconstruction was carried out. According to O'Leary [6], deconstruction and reconstruction enable researcher to extract important data into smaller units [6]. Next, the units are grouped in two categories, which are from the front and reverse view of the third series of MYR banknotes. The outcome of the analysis is then tabulated and summarized (see Tables 61.1 and 61.2).

61.2 Findings and Discussion

The third series of MYR banknotes has been circulated all over the country and overseas since it was first introduced in 1996 with a theme of "Vision 2020." The visuals depicted on the banknotes are meant to signify the country's journey toward a fully developed nation by the year 2020. Despite this fact, most of the images in the banknotes seem to depict only economy and cultural. The images of social (to establish united Malaysian nation made up of one Bangsa Malaysia) and spiritual however are lacking and cannot be easily traced. The social and spiritual elements will show a united Malaysian nation but also harmony, balance, and togetherness.

The third series had reintroduced Jawi script on the reverse side of the banknotes that is not included in the first and second series. Ironically, the Jawi script can be found imprinted on the banknotes during the British colonial era in Malaya [8]. The Jawi script that originated from the Arabic was an adaptation for writing the Malay language, hence describing the Malay identity, sovereignty, and Islam as its religion.

Table 61.1 Semiotic analysis on a front view of third series of Malaysian banknotes

Representamen	Object	Interpretant	
Portrait of a man	The first Yang di-Pertuan Agong of Malaysia (the king)	Iconic figure as head of the state of Malaysia	
		Symbol of authority, dignity, and unity for Malays	
		Guardianship for the Malays and indigenous peoples (including Sabah and Sarawak people) [1]	
Background pattern	Songket pattern and Pixerized images[a]	Traditional attire (social fabric) that evolves to modern fashion. Once a symbol of status only worn by the royalty and aristocracy, but today it can be use by everyone on special occasions [10, 12, 13]	
Roman typeface	Bank Negara Malaysia	Central Bank (governing body that is responsible for the issue of banknotes)	It also denotes modernity (western influences) and globalization
	Satu Ringgit, Dua Ringgit, etc.[b]	The denominations of the banknote	
	Wang kertas ini sah diperlakukan dengan nilai	Medium of payment is allowed by legal system with certain value	
Freehand writing	Governor signature	Authority and empowerment	
		BNM Governor Tan Sri Dr. Zeti Akhtar Aziz is the first woman in the position, which also symbolizes government acknowledgment toward women	
Symbol of RM	Ringgit Malaysia	Establishing Malaysian currency in the world	
A roman number	1, 2, 5, 10, 50, and 100[b]	The denominations of the banknote	
Stylized flower	Hibiscus	Official national flower	
		Symbolic of Rukun Negara	
A clear window incorporate of a building[c]	Perdana Putra	Prime minister's office	
		Executive branch of the Malaysian Federal Government	
		One of the national identities/symbols	

[a]Each denomination has a different songket pattern
[b]Based on the denomination
[c]Only on RM5 polymer

Table 61.2 Semiotic analysis on a back view of third series of Malaysian banknotes

Representamen	Object	Interpretant
Mounts, kite, and coastal area (RM1)[a]	Mount Kinabalu, Mount Mulu, Wau Bulau, coast beach	Tourism, culture, and heritage
Telecommunication tower, a satellite, and a graphic globe with a map (RM2)[a]	Kuala Lumpur Tower, MEASAT satellite, and a map of Southeast Asia	Information
		Connection
Twin tower, a building with a tower, and map (RM5)[a]	Petronas Twin Tower, Kuala Lumpur International Airport, a map of Putrajaya and Cyberjaya	National landmark with world-class infrastructure
		National pride
An aircraft, a train, a cargo ship, and graphical lines and shapes (RM10)[a]	Malaysia Airlines Boeing, Putra LRT, MISC cargo ship, and graphical symbols of highways and train tracks	Logistic
		World-class public transportation
A petroleum activity and graphic lines and shapes (RM50)[a]	Petronas petroleum platform and oil and gas activity	National treasure
		Progressive
A car production line, an engine, and graphical lines and shapes (RM100)[a]	Proton car manufacturing industry	Industrial
		Development
		The spirit of Malaysia Boleh!
Jawi Script	Bank Negara Malaysia	Malay old script (identity and tradition)
	Satu Ringgit, Dua Ringgit, etc.[b]	Islamic influences [8]
A symbol of an animal with a crescent moon and a round shape	Bank Negara Malaysia logo	The Kijang (barking deer) gold coin from Kelantan dated in the seventeenth century. The crescent moon represents Islam as the official religion and the round shape represents the sun that symbolizes power
A vertical and horizontal roman number	Serial number of the banknotes	A unique code for identification of a single unit
		For security and to prevent counterfeiting
Stylized flower	Hibiscus	Official national flower
		Symbolic of Rukun Negara
Symbol of RM	Ringgit Malaysia	Establishing Malaysian currency in the world
A roman number	1, 2, 5, 10, 50, and 100[b]	The denominations of the banknote

[a]Illustrations based on denomination
[b]Based on the denomination

It is during Tun Mahathir's tenure as prime minister that the spirit of Islamization was felt.

Appointing Tan Sri Dato' Sri Dr Zeti Akhtar Aziz as the governor of Bank Negara Malaysia is a great acknowledgment toward women's achievement in Malaysia. It shows that Malaysia is a modern and developed nation that establishes a fair and equitable society. Another interesting feature about the third series of MYR banknotes design is perhaps the use of RM as a symbol for Ringgit Malaysia to replace the symbol $. This in a way signifies Malaysia's economic liberty, establishing Malaysia currency in the world. However, if we can design a specific symbol such as pound (£), dollar ($), yen (¥), and euro (€), we can establish our history, identity, and civilization to the world. The symbol does not only function for the identification of the Malaysian currency but also promote Ringgit in the international monetary system [3].

The juxtaposition of the image of a car manufacturing plant in RM100 and oil and gas industry in RM50 is rather strange. In our opinion, oil and gas industry (in this case Petronas) is the most important asset of the country, whereas the car manufacturing plant (in this case Proton) can be considered as the nation's liability. Although it is significant to inspire the spirit of Malaysia Boleh! nonetheless, in terms of social and economy achievement, Petronas with their contribution should be the main denomination. But we have to bear in mind that Proton was realized under the direction of the Tun Dr. Mahathir Mohamad and it is his idea of transforming Malaysia toward an industrial country.

RM5 banknotes display a collage of images, which include mega-projects from Tun Dr. Mahathir's vision of Malaysia as a developed country. The visual codes that have strong connotation of Mahathir's legacy can be seen in RM5 note, which contains popular landmarks including Petronas Twin Tower, Kuala Lumpur International Airport, Perdana Putra, and the maps of Putrajaya and Cyberjaya. The idea is to restore national pride and command respect for Malaysia on the world stage.

61.3 Conclusion

Despite the fact that the third series of banknote is no longer in production, its visuals are by far the most meaningful and relevant to Malaysian history. Part of the reasons is mainly because the visual codes on the banknotes reflect the idea proposed by the former Malaysian minister Tun Dr. Mahathir Mohamed. This includes the depiction of popular landmarks such as the Petronas Twin Tower, the Kuala Lumpur International Airport, the Perdana Putra, and the maps of Putrajaya and Cyberjaya. In this study, we conclude that the third series of banknotes could be regarded as a powerful media that apart from promoting the national aspiration Vision 2020, it also pays homage to the architect behind the plan (Tun Dr. Mahathir Mohamad).

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Chapter 62
Symmetry in Malaysian Paintings: A Compositional Analysis

Alina Abdullah, Nur Izaura Razis, and Sumardianshah Silah

Abstract Symmetry is the most fundamental principle of harmony in art, and it would not be excessive to suggest that symmetry is one of the basic principles that underlie the structure of the greatest art so far produced in the history of art, in reference specifically to dynamic symmetry. This study shall focus on the elements of dynamic symmetry that were systematically formulated by Jay Hambidge in the 1920s. The principles of dynamic symmetry that will be used in the study are root-five rectangle and the whirling square rectangle. These elements of dynamic symmetry will be extrapolated onto some Malaysian modern artworks as an attempt to describe the basic structure that underlies the composition of such works. This study is also based on the theory of composition and art history method. Using this underlying theory and method, this study will trace the dynamic symmetrical thread that underlies Malaysian modern paintings. Ten paintings from the collection of the National Visual Art Gallery, which fall in figurative themes, from the 1960s onward will be analyzed.

Keywords Dynamic symmetry • Composition • Malaysian modern art • Paintings

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62.1 Introduction

Symmetry or proportion[1] is the most fundamental principle of harmony both in the universe and in art since it is the foundation of the unification of the laws of beauty. Given this fact, it would not be excessive to suggest that symmetry is one of the basic principles that underlie the structure of the greatest art so far produced in human history.

But, it should be noted that the type of symmetry applied in the abovementioned artworks is characteristically static—that is, a symmetry which has a sort of fixed entity or state and is often radial and by which the units of form are orderly arranged about a center [2]. Almost in all cases, these units of forms are parts of the recurrence elements of the square, equilateral triangle, and the regular pentagon. However, there is another type of symmetry as can be found in the Greek and Egyptian arts, namely, dynamic symmetry. As a matter of historical fact, the theory of dynamic symmetry was systematically formulated for the first time in history in the 1920s by an American artist Jay Hambidge, based on his meticulous inspection of classical buildings such as the Parthenon and the Temple of Apollo at Tenea, of Zeus, and of Athena in Greece.

According to Hambidge, dynamic symmetry is a special type of symmetry by which members of an organism—such as in a shell or the adjustment of leaves on a plant—are arranged orderly and thus evoke life and movement [3]. Its great value lies in its power of transition or movement from one form to another that produces the only perfect modulating process in the artwork. Basically, dynamic symmetry is based on Euclidean concepts of the diagonal of a square and uses certain ratios and specific root rectangles of which the rectangle of the golden section[2] is the most important and the only aspect of it [3].

Dynamic symmetry—according to Hambidge—is a method of establishing the relationship of areas in design and composition. Hambidge then suggests that the principle of Greek design be placed on this interrelationship of spaces, although the lines concerned may be, or commonly, incommensurable. He also treats the mathematical elements in design and interprets them by using the analysis of rectangles.

The foregoing facts have prompted me to turn my attention to Malaysian art scene to study or trace the dynamic symmetrical thread that underlies our contemporary artworks.

[1] The term symmetry (or *summetria*) is a different concept from the nineteenth century one. Symmetry, and in Greek summetria, has one basic meaning and that is proportionality. For further readings, see [1].

[2] The golden section is the ratio of the longer to the shorter side of a rectangle which has the value of 1.618.

62.2 Malaysian Modern Arts

If one looks at the development of modern art history since the 1960s, one would surely be aware that most of the art historians have turned their attention to the sociopolitical, cultural, and psychological aspects. The formal aspect has been discussed merely in terms of abstract impressionism. Studies on formalistic aspect can rarely be found, especially from the compositional aspect which is based on geometrical structure. Conscious or not, the sense of compositional structure is embedded in every artist, which he or she unconsciously adapted from nature. This sense of compositional structure is then translated into their paintings. Thus, the present study aspires to explore certain Malaysian paintings from the aspect of composition on picture plane, by deploying the method and approach in the theory of dynamic symmetry, in order to decipher their underlying compositional structure. Some academic circles in Malaysia have endeavored to provide theoretical explanation and scholarly interpretation on certain Malaysian paintings, and in a logical sense perhaps, and in so far as the use of symmetry in the composition of an artwork is concerned, the academic study of the composition of artwork by Malaysian artists is only confined to modern definition of symmetry—such as the mirror reflection, the bilateral rotation, etc. It is no wonder therefore that it is difficult to find any academic study that pays attention to the use of dynamic symmetry in Malaysian contemporary artworks.

To fulfill this purpose, this study shall only select and examine 10 paintings[3] selected from the permanent collection in the National Visual Art Gallery, Kuala Lumpur—which fall into figurative theme—ranging from the paintings produced from the 1960s.

62.3 Underlying Theory of the Concept of Composition

There are at least two normative practices of composition in art history, that is:

- As a way to express the mental content (or state) of an artist through formal values—colors, lines, light, etc. [5].
- As an analysis of hidden structure that underlies each picture plane, and through such attempt to decipher the inner structure of an artwork, it complements the interpretations of iconography and iconology [6].

It should be noted at the outset that the analysis of composition in this study shall only deal with its description rather than delving into another stratum, that is the meaning of composition which is pertinent in the contexts of the rules of

[3] All pictures were taken from [4].

composition,[4] psychological response,[5] or philosophical intuition [12]. Hence, in order to describe the underlying structure in certain Malaysian modern paintings, the study shall deploy Kuhn's theory of analysis of composition—which has been developed as a means to "explain the inner structure, the construction and the narrative figuration" [5]. Therefore, it is worthwhile to base the framework of the present study on this theory of composition in deciphering the underlying hidden structure present in certain Malaysian modern paintings.

62.4 Analysis and Findings

The preceding discussion may suffice in providing one with general idea about dynamic symmetry and its application, and thus it is high time now to put it at work in order to analyze the composition of selected Malaysian paintings. Before I analyze these paintings, it should be noted however that the compositional analysis can be divided into three bases of analysis, namely:

- Analysis of inner structure
- Analysis of image construction
- Analysis of narrative figuration

Analysis of Inner Structure

Figure 62.1 shows the layout of the harmonic subdivision rectangles, which are based on dynamic symmetry. The expositions of dynamic symmetry in Fig. 62.1 contain 10 pictures with nearly root-two dimension. Although some of the layouts are not corresponding exactly to the dimension of the full plane, still the layout structure fits the definitions of figures and motifs.

The layout of the root-two rectangle is divided into half, and the diagonals of the half and the rectangle and its reciprocals are drawn. Based on these diagonals, the rectangles are subdivided either into 9 or 16 smaller root-two rectangles. Figure 62.1e–h is based on vertical layout of the rectangle, while the rest are in horizontal layout.

[4] According to [7], "…if we wish to make a Picturesque work of art we must introduce a lot of angular lines…If we wish to produce a Graceful work, we must use a lot of serpentine lines accompanied by Order…If we wish to produce a Sublime or monumental work of art, we must use pyramidal lines and masses accompanied by Order…The Fourth law is: Unity of Thought…The Fifth law is: Concentration of effects…The Sixth law is: Balance of Masses…The Seventh law is: Clearness of Meaning…The Eight law is: Simplicity…The Ninth great law is: Proportion…The Tenth law is: Harmony."

[5] For further details on rules of composition and psychological response, see [8]. See also [9–11].

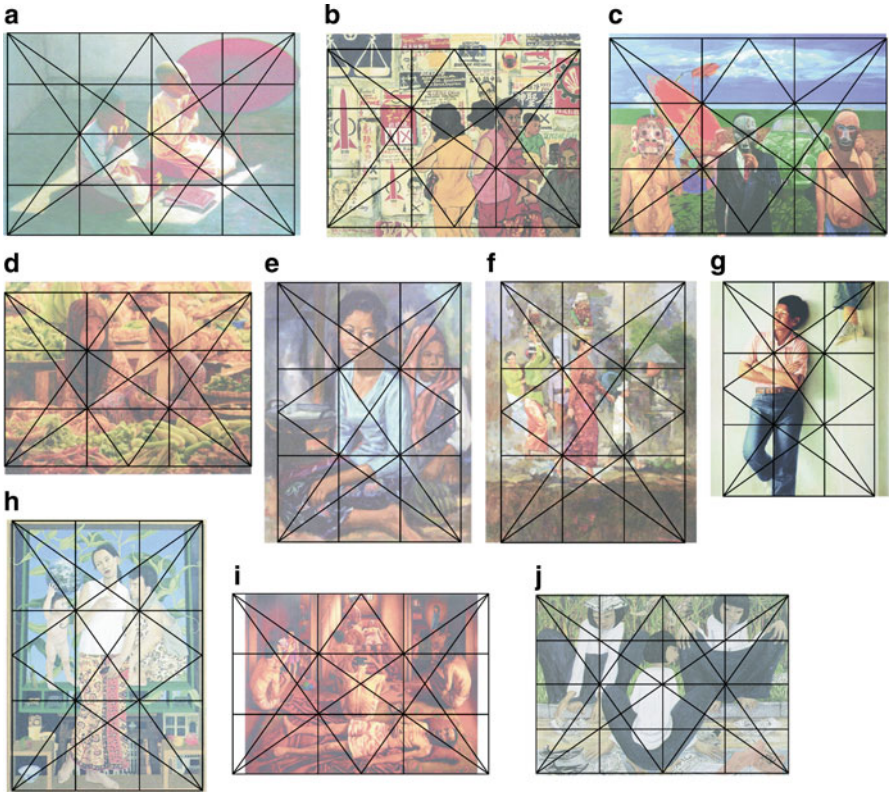

Fig. 62.1 Harmonic decomposition of the dynamic symmetry rectangles

For example, Fig. 62.1j is based on root-two dimension, and the layout of the root two is the subdivision of the 9 smaller root-two rectangles, and Fig. 62.1d is the layout of the root two which is subdivided into 16 smaller root twos.

Analysis of Image Construction

Figures and motifs are placed alongside the lines of the compositional construction, that is, crossing lines and diagonal lines and its reciprocals. There are also figures and motifs exactly on these lines. Except for Fig. 62.1b, h, and partly (i), the rest of the plates show that figures and motifs are situated alongside the parallel lines or the diagonals. Most of the figures are situated exactly in the subdivision grids of rectangles and squares. The planes are also divided into four horizontal panels, which demarcate certain parts or motifs in the picture plane. This subdivision also creates spatial depth in the composition. The paintings that best represent this format are Fig. 62.1a, i, j.

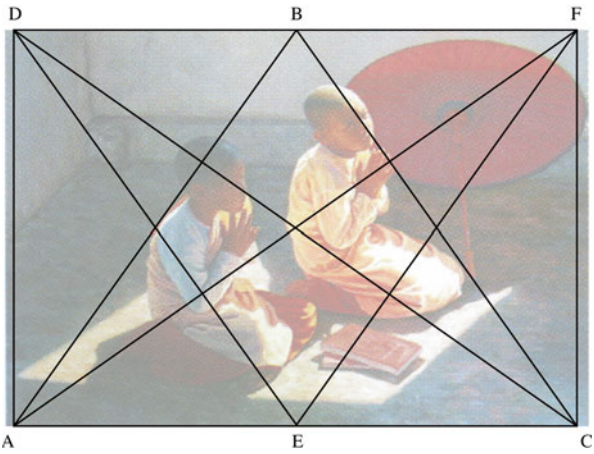

Fig. 62.2 Diagonal lines and its reciprocal

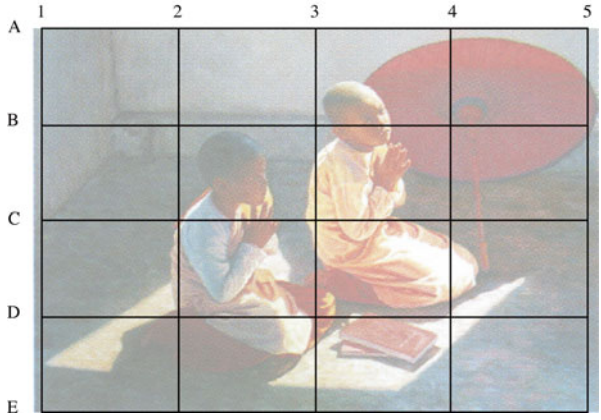

Fig. 62.3 Grids derived from the diagonal and its reciprocals

Figure 62.2, for instance, contains four objects, two objects being a book and a red umbrella. Figures are contained inside the crossing lines of ABC, which form a triangle shape. The hands of the two figures are placed on diagonal line of AF. The book is exactly on the crossing line of EF. The first figure is located in the grid 3D4, while the second figure is situated in the grid 2B and 3E (Fig. 62.3). The book is situated in the D3 and E4. The red umbrella is placed on the 3C5. The points of interest in this layout are at the intersection of crossing lines and parallel lines, which is P1–P5 (Fig. 62.4).

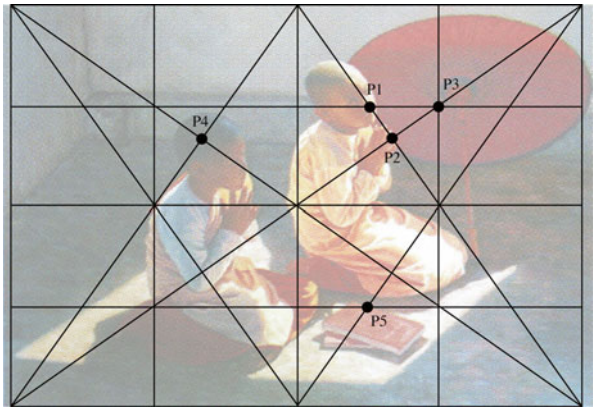

Fig. 62.4 Points of interest

Analysis of Figurative Narration

Grids and lines are the guidelines to connect motifs and figures and detect the spatial relationship between the figures. The figures are placed at the lines, either exactly on the lines or alongside the lines, and this in a way depicts the Gestalt psychological perception [9]. The eyes tend to follow direction at the point of interest and accordingly to the figures that are composed in the picture plane. This can clearly be seen in Fig. 62.1. The focal point of the plane could be the main narrative of the composition.

For example, in Fig. 62.1a, the composition of the two figures inside the compound of the diagonals indicates that these two figures are the main subject in this painting. Books and umbrella are secondary narrative, which complements the main narrative. It goes in the same way for Fig. 62.1c, wherein the figure at the center, which is accompanied by the two figures on the left and right, is the main narrative for this picture. The kite and the car at the back represent the secondary motifs that complement the main narrative. And it is the same with Fig. 62.1b, i, j.

Figure 62.1e, on the other hand, only focuses on one main figure as the focal point, which is the figure exactly at the center of the picture plane. Figure 62.1g also focuses only on one figure and so with Fig. 62.1h, in which the main figure is placed exactly at the middle of the picture, in parallel line. It is quite different in the plane that has two figures as the main focal point such as Fig. 62.1a, d. In this case, one is to identify the intersection of the diagonal lines and the parallel lines, which form a point of interest to the picture plane. The figure which complies most with the point of interest of the structure becomes the main narrative, and the second figure complements the whole narrative.

The connection link between the figures depicts a sense of harmonic balance. This can be achieved when the figures have the same relationship, which in this case is the spatial relation between the diagonal and crossing lines. Different figures are placed on the opposite side of implied geometrical layouts.

62.5 Conclusions

The analysis may suffice to prove the existence of hidden structure in Malaysian paintings. The selected paintings (samples) are suitable to be the object of analysis based on the findings. And from the assessment of these paintings, it shows that each artist has his or her own compositional formula. This point of fact must have given credence for the present study in so far as to provide a deeper meaning and added value to such paintings.

Most of the paintings fall into root-two dimension. This is a startling point since root-two dimension of the ratio 1:1.414 is very uncommon, whereas the whirling square rectangle, which is the most important ratio, that is, 1:1.618, or, for example, measures nearly up to 5 by 8, is not popular among the artists. If one looks at the Western context, one would clearly see that most people prefer to use the term golden section, albeit its structure tied up to the grid lines which is divided into three divisions, and so with the root one, or square, which is the most convenient panel rarely applied by Malaysian artists.

Nevertheless, almost all the selected paintings comply with the principles of harmonic dynamic symmetry. For instance, the placement of the figures is either in the grid lines or in the diagonal compounds. The primary narrative has always been placed at these compounds or situated at the point of interest. The structures of dynamic symmetry also depict a spatial sense or relationship between the images.

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Chapter 63
Graphic Elements in the Portuguese Cartography of Malacca

Wan Juliana Emeih Wahed, Mursyidah Zainal Abidin, and Wan Samiati Andriana Wan Mohd Daud

Abstract This research was conducted in order to identify the roles of graphic elements applied in the Portuguese maps during their colonization in Malacca. The maps during the Portuguese era have been divided into three (3) phases – Phase 1 (fourteenth century), Phase 2 (fifteenth century), and Phase 3 (sixteenth century). The maps in the fourteenth century are more simple yet informative, the elements of graphics are limited to a few varieties of lines – vertical, horizontal, dashed, or dotted lines – while the lettering for descriptions and legends was handwritten. Meanwhile in the fifteenth century, the map style has changed whereby the images applied in the map had been stressed up, and the Portuguese seems like intentionally drawn the image of Fort Santiago at the front of the map to show the power and control of the Portuguese during that time. The Fort Santiago can be symbolized as the political or military power and authority of Portuguese. And in the sixteenth century, colors have started to be applied in order to show the distinction and areas dominated in the map by the Portuguese and other countries. Consequently, with the usage of elements and principles of graphics, the development of Portuguese culture, the structured economy, and the spreadings of Christianity in Malacca can be traced in the map. Conclusively, the graphic elements in cartography played a big role in interpreting and stimulating the ideas of the cartographer into the selected medium, which is the map. And finally, the dissemination of new knowledge and information on historical maps of Malacca during the Portuguese era can be perceived by Malaysians especially to the young generations.

Keywords Cartography Malacca • Graphics • Elements: Portuguese map • Roles

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63.1 Introduction

It is believed that the first Sultanate or Malay Kingdom in Peninsular Malaya started in Malacca. According to the sixteenth-century Malay records, the city was founded in 1400 by a Hindu Srivijayan prince named Parameswara. Historically, the name Malacca was derived from a tree with the same name. As written in the history of Malacca, Parameswara, who is later known as Raja Iskandar Shah, went hunting in the area, and as soon as he reached the Malacca River, he stopped to rest and refresh. When he was standing near a Melaka tree – Indian gooseberry tree – he was amazed to see how one of his hunting dogs got so startled by a mouse deer, and the dog fell into the river. As the scene amazed him, he took this as a promising sign of the weak overcoming the powerful [1]. Hence, he decided to build the capital of his new kingdom in the area where he stood, naming it for the tree under where he had been resting. Malacca has at least seven major races – Malays, Chinese, Indians, Eurasians of Portuguese decent, English, Arabs, and a small minority of Dutch people living here. They shared the culture and are acculturated – adapting foreign culture into the existing local culture [1]. Moreover, the Malacca itself was governed by different colonial eras – Sultanate era (1400), Portuguese era (1511), Dutch era (1647), and British era (1824) – and each of them highlighted their own parts within Malacca. Hence, it is compulsory to reveal the history of every colonial era and to analyze every period of the eras appropriately.

63.2 Basic Elements of Graphic Design

Basically, art cannot exist without the elements of design because the elements are the fundamental building blocks of art. On the other hand, the principles of design describe how the elements of design come together to create a design [2]. Therefore, the principles and elements are connected to each other and difficult to separate since the principles of design are about combining elements. In order to create a piece of artwork, it is compulsory to combine the design elements and principles. One design can be deemed successful when a designer uses well-established design principles [3]. Designers create images, icons, textures, patterns, diagrams, animations, and typographic systems by using the elements of point, line, and plane, since those three elements are considered as the building blocks of design. By using the elements of points, lines, and planes, diagrams can be related to map and connect data. From the large group of points and lines that repeat, rotate, and otherwise interact to form distinctive and engaging surfaces, textures and patterns are constructed. However, colors are divided into three properties, which are hue, value, and intensity. Hue consists of three primary colors, which are yellow, red, and blue. By mixing two primary colors together, a secondary color will appear. Intermediate colors are mixtures of a primary and an adjacent secondary color. The value is referred to the lightness and darkness of hue, while the intensity or also known as "chroma" is referred to the purity of hue [4].

63.3 The Graphic Theoretical Basis

The theoretical basis of graphics, such as informative aspect, composition, usability, graphical hierarchy, and aesthetic aspect, needs to be explained in detail within this chapter as they are the crucial elements of the relationship between cartography and graphic design [5]. Therefore, the transmission of information is the first thing to be highlighted between the graphic design and cartography. On how the map is presented and perceived by the user depends on how the messages are delivered. Therefore, the correct interpretation of facts and data presented on maps or graphics can ensure that the knowledge is being transmitted effectively [6]. Hence, how the elements or the components in maps relate to each other depends on the wise ways of arrangement and composition by the cartographer and graphic designer, making the map easy to be read and interpreted. The map can be distinguished in two types, which are the "closed composition" and the "open composition." The closed composition is when the elements of a map layout are placed in typical areas, as in topographical maps or atlas maps, while the open composition is in free arrangement where a map is combined with texts, photos, and diagrams such as in press maps and maps in travel guides [7]. Nevertheless, aesthetic is the modern meanings of beauty, taste, and artistic criteria. The information applied in maps should not be only useful but also need to attract the users' attention. This can be done by applying aesthetic dimensions of graphics in the map. Elements like colors, line styles, relief visualization, font types, legend, map margin, overall impression, and symphony of colors in the composition should be considered in order to ensure that the knowledge in map is successfully transferred.

63.4 Cartography Terminology

Cartography or "map making" is derived from Greek word "Chartes" or "Charax," or "sheet of papyrus" and "Graphein" or "to write." Therefore, cartography means the study and practice of making maps. A "cartographer" is the title given to the one who makes maps. Cartography builds on the idea that reality can be modeled in ways that communicate spatial information effectively by combining science, aesthetics, and technique in one map. Basically, the artistic method is characterized as synthetic, autographic (revealing the character of the maker), and creative. It is different with the scientific method which is more analytical, independent of the scientist, and reportive in character. However, both can be deemed as a form of mental activity, especially in one as complex and interdisciplinary as cartography. This view of cartography can bring several implications, but the main aim of the cartographer is to produce a satisfactory aesthetic experience by adding the elements of artistic creativity. Whether the typography used color symbols or even projection, the decisions are made with user's sensibilities in mind and the artistic method in action.

63.5 History of Portuguese Cartography

In May 1511, the Portuguese with 17 ships arrived at the center of the trade on the southern part of the Malay Peninsula, Malacca. Eighteen months before the arrival of the Portuguese in Malacca, the city was not known until a Portuguese fidalgo, Diogo Lopes de Sequeira (1465–1530), was sent to analyze the trade potential in Madagascar and Malacca, and on 11 September 1509, he arrived safely in Malacca. When he discovered that Sultan Mahmud Shah, the local leader, was devising his assassination, he left Malacca in 1510. While Diogo Lopes de Sequeira returned home, Alfonso de Albuquerque took this opportunity to embark upon his expeditions of conquests. A map by Manuel Godinho de Erédia, "Fábrica da Cidade de Malaca: intramuros. Anno 1604" was an example showing how Malacca was discovered by the Portuguese. A Portuguese pilot and cartographer, Francisco Rodrigues, prepared around 1513 a short narrative on maritime routes in the east of Spice Islands and accompanied it with 26 cartographic sketches. A brief description of the route to Malacca to China has been described in the map based on information garnered from sailors on the quay of Malacca. And in 1519, a Portuguese cartographer and instructor in cartography, Jorge Reinel (c. 1502–after 1572), designed maps for countryman, Ferdinand Magellan, to use for his trips. The Maluku Islands depicted by him were used as a basis for Spanish claims on them.

63.6 Discussion

The present view and mapping of the world is led by the centuries of great expeditions. Ever since man knows how to write, map has been used widely to visualize reality and what is within their imagination, and how people perceive the world, will influence the content. Thus, it can be drawn here that studying of maps is all about how visualized regions are experienced, imagined, or meant to be perceived. In addition, the social and political objectives may also influence on how the map should be drawn. The essential instrument in mapping and preserving cultural heritage is by adding the graphic elements in the map. As the cartography is a type of art, the visualization techniques, precision, and compliance with reality are of main interest. The contents of the map by means of using the graphical language, and to this date this language, remained clearly perceptible graphics that represented real-world objects. The art of printing is defined as the act, process, or practice of impressing letters and characters of figures on paper, cloth, or other materials. The obvious point to note is that the transferred or pressed marks are exact mirror images of the originals. To define the areas of research susceptible to analysis through print techniques and to indicate how the application of this technique can deepen our understanding of the structure and order of the world we live in. The researcher will show the development of the old Malacca cartography works from the Portuguese era, which is known as the most vital period of the development of Malacca maps.

The researcher therefore divides the cartographer's works to a general division during the most important time phase that is between the fourteenth (14th) and the sixteenth (16th) centuries which are illustrated by the annexed 11 maps of Malacca by the Portuguese. The researcher has paid the most careful attention to the chronological accuracy of the dates given that this research might serve the valid generalization. Phase 1 is represented at the beginning of the fourteenth (14th) century, Phase 2 is in the fifteenth (15th) century, and Phase 3 covers the works of cartography in the sixteenth (16th) century. Each phase performs its own maps; however, the maps of the fourteenth to the sixteenth century were strongly sufficient for this research because it serves the same time the Portuguese era. During war, in the fourteenth century, cartographer's works mostly used the topographical map method. The use of variety of lines can be found in almost every part of the map. Various types of line – dotted, dashed, vertical, and horizontal – were applied in the map in order to differentiate the areas, which depend on the size and extent.

As maps are tools that people use to identify location, the use of map being drawn during that time was to basically guide the sailor to Malacca. The first features usually noticed on a topographical map are the area features, such as vegetation (green), water (blue), and densely built-up areas (gray or red). The formal connection between a symbol and what it designates or its syntactic features is not available, but only performs as a representative. Most of the lettering style during the fourteenth century was using a handwritten technique, one of them called as Roman square capitals handwriting, which seems to be similar to the writing on the map. Roman square capitals (capitalis quadrata), or also called as Elegant Capitas (capitalis Elegans), are an ancient Roman form of writing and become a starting point for modern capital letters, which are mainly used in manuscripts. The content written in the map was limited; however it was very straightforward and easy to understand by the viewers even though the language used is in Portuguese. However, the map drawn by the cartographer during the fifteenth century looks more like a drawing rather than a typical map. There is one made in 1515 named "das Lendas da India de Gaspar Correia" in the Portuguese language. A cartographer, Gaspar Correa (1496–1563), has drawn numbers of images which describe the condition and the surroundings during the Portuguese reign. Images such as the church, fort, houses, building, school, roads, bridge, river, trees, and fences and walls have been drawn symmetrically to show the pattern of Portuguese involvement in Malacca. The building has also been added to give a taste of the vernacular architecture.

The graphic elements such as lines, shapes, and space have been repeatedly sketched in the map in order to show a fortified and flourishing city, the center of all Portuguese military forces and arsenal in the island. By analyzing the data, it can be seen that the cartographer stressed his sketches on the real environment of the Malacca with the drawing of layout plan in details. What is so interesting about this map is the various types of building that have been drawn intentionally to show the power of the Portuguese during that time. The fact that Malacca has been colonized by the Portuguese cannot be denied as the iconography symbol of the Portuguese, Fort Santiago, and this is located at the front part of the map. Fort Santiago has been rendered in detail that even the bricks can be notified and give meaning as it was a

central part of painting message. The ideas of worldliness, political or military power, and authority can be interpreted in the map by the ideas of Fort Santiago as the represented iconography. Furthermore, the fences drawn surrounded the district and strengthened the theory of power possessed by the Portuguese. The work during the sixteenth century is created during the conquest of the Portuguese in Malacca. The work within this period exhibits the geographical and ethnographical positions of all aspects. Fort Santiago was one "masterpiece" created by the Portuguese when they reigned Malacca city. This fort became the power symbol of the Portuguese, before the destruction and discovery of Malacca by Dutch, and later became a Malaysian treasury. Cartographers have done an excellent job while creating a map during the sixteenth century when combining the elements of graphics efficiently and at the same time transferring the knowledge to the users wisely. The revolution from the previous idea of map making seems to develop in contrast with that of the fourteenth, fifteenth, and finally the sixteenth centuries. The distribution of districts and livelihood source during that era can be traced easily as it is drawn in the map.

63.7 Conclusion

It can be said that the maps made by the Portuguese experienced a slow change from the fourteenth to the sixteenth century. The chronological order of the graphic elements applied can be understood clearly when the changes can be detected by the researcher efficiently. The roles of graphic elements are limited during the fourteenth century because the usage of graphic was limited only to various lines; hence, the information of Malacca is limited to the viewers. However, in the fifteenth century, cartographers started to add graphic elements such as shapes, forms, and lines to differentiate between images applied in the map. The symbolic meaning behind the drawn images can be achieved when the "power" of the Portuguese reign is absorbed by using the images of Fort of Santiago and the brick walls that surrounded the district of Malacca. Another graphic element, color, started to be placed in the maps by the Portuguese cartographers of the sixteenth century in order to show the distinction between images and areas. As a conclusion, the graphic elements in cartography played a big role in interpreting and stimulating the ideas of the cartographer into the selected medium, which is the map. And finally, the dissemination of new knowledge and information in the historical maps of Malacca during the Portuguese era can be perceived by Malaysians, especially the young generations. More research should be conducted, especially in the acceptance of the proposed ideas among the practicing artists or the patrons of the art.

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Chapter 64
Preventing Childhood Obesity Through Poster Design

Hafizah Rosli and Ruslan Abd. Rahim

Abstract This research aims to investigate and set design improvements of health campaign posters toward obesity. The Malaysian government through its agency Kementerian Kesihatan Malaysia has aggressively campaigned awareness regarding health issues through poster design. According to literature review, this medium of campaigning, which started a decade ago, places an emphasis on critical illnesses such as dengue fever, cancer, heart disease, and smoking. Despite this, based on the preliminary survey results, it is observable that there is no specific campaign that focuses on childhood obesity. Previous posters were all focused on obesity as a common problem. In this study, an exploratory study had been applied. A survey was carried out among young parents in Selangor. The findings show that 60.8 % of the respondents are not familiar with previous obesity campaigns [1, 2]. This can be concluded that educating the parents on a healthy lifestyle can prevent childhood obesity through posters in Malaysia and is an important and early preventive measure to take and should not be overlooked. It is hoped that the results of this study will assist the related government bodies and departments regarding the need for a communicable poster design in creating awareness about childhood obesity for the Malaysian public.

Keywords Poster design • Childhood obesity campaign

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64.1 Introduction

Children today are seriously affected by a new epidemic that is described as "childhood obesity." The rate of childhood obesity increases every year in Malaysia. The New Strait Times newspaper, in 2012, reported that *Obesity in Malaysia Is on the Upward Trend* and drives to various complications and Malaysia has the highest obesity rate among Southeast Asian countries. Besides that, according to Farik Zolkepli, 2011, in The Star newspaper article entitled *Time to Cut The Fat, Malaysia*, basically the key alarm for the Ministry of Health Malaysia is to reduce the figure from increasing to a critical situation. This problem occurs because of unhealthy eating habits, inactive lifestyle, and a general lack of health awareness among the parents. Parents today are not conscious of their family lifestyle. The problem will not be present if parents are aware of healthy habits [3, 4]. Parents should encourage their kids on how to have a healthy lifestyle to prevent obesity from the early age through a poster design as one of the media channels. The previous health poster campaign was not communicable enough to capture the parents' attention in order to educate their children on how to have a healthy lifestyle. Hence, as the parent's awareness toward healthy lifestyle increases, it is hoped that the rate of childhood obesity in Malaysia will reduce on an annual basis.

64.2 Method

According to academic resources from Monroe College, exploratory research is conducted to provide a better understanding of the situation. In this study, an exploratory research had been done to find out what are the parents' perception toward the previous obesity poster design campaign that led to the rising of obesity in Malaysia especially the children. A mixed-method study involves the collection of analysis for both quantitative and qualitative data [5–7]. In order to fulfill the objectives of the project, the concurrent nested strategy has been employed.

Sampling

A snowball sampling [8] was adopted in the study. The sampling uses a small pool of initial informants to nominate, through their social networks, other participants who meet the eligibility criteria and could potentially contribute to a specific study. In general, snowball sampling is a type of convenience sampling; participants for this research survey basically are young parents, aged 25–35 years, having children, determined via online network. In this survey, a group of people recommended by participants having met the criteria.

Fig. 64.1 Graphic design for health campaign

Data Collection

According to the concurrent nested strategy [9] process, both quantitative and qualitative methods can gain much knowledge by viewing those methods in different perspectives either from different types of data or levels within the study.

A case study is expected to catch the complexities of a single case. A single leaf, even a single toothpick, has unique complexities – but we rarely care enough to submit it to case study ([10]: ix). By looking at the design of the Malaysian Health Poster Campaign from 1991 to 2012, the researcher was able to identify that the Health Ministry began to produce a poster campaign that provided a basic awareness on health issues in 2005 with the title of "Sihat Sepanjang Hayat" (Fig. 64.1).

A focus group is part of the qualitative method that had been applied in this study [11]. This method commonly sets meetings upon systematic appointment to discuss about the given topics that have been prepared in question form. The materials required collecting information such as objects, artifacts, photographs, drawings, newspaper clipping, short video, and audio recording that helps the groups focus on the topic of interest (Gary [12]). In this dissertation, 10 participants had given their feedback in a discussion on the question "what contributes to childhood obesity today?" *All of these participants had obesity problems and similarly even their children*. The discussion was held at Nursehat Health Club in Shah Alam, Selangor, on 31 October 2012. The discussion took about 1 hour, and a few problems had been identified through this meeting.

A questionnaire survey had been forwarded out to *60 participants via online*. A statement by Evan and Mathur in 2005 postulated that it has been estimated that at least a third of all surveys worldwide are online surveys and the trend is upward. Besides that, there are a lot of *advantages doing it online*, for example, the *low cost involved, saves time, ease of use, lack of spatial restriction, and a very high response rate* as compared to the normal face-to-face survey [13]. Participants had been identified by *using snowball sampling through specific criteria and demographic*. Basically participants that have been forwarded with the survey are *young parents aged between 25 and 35 years with children that are aware and interested to change life-*

style for a better future and support to stop obesity [14, 15]. A quantitative method had been employed in this study by distributing out a four-questionnaire set to identify the problem as to why the parents with children stated in the discussion lack of awareness of a healthy lifestyle. The first set of questionnaires had been sent out to the participant as a pilot survey so as to identify the *previous problems in the Ministry of Health's poster campaign design*. In this study, four sets of questionnaires had been sent out through online survey. Close-ended questions had been sent out to the 60 participants, and 50 responded. The second set of questionnaire is to *specifically identify the suitable graphic elements.* The fourth questionnaire relating to *the post-testing design evaluations* as a face-to-face feedback survey is based on the same as the online questionnaire. Ten individuals responded to the questions, and it is the posttest evaluation that supported the online results. All the answers in the survey basically resulted in design improvements for a proposed poster design [16].

64.3 Result and Discussion

The parameter of this case study is essentially focused on the health campaign done by Kementerian Kesihatan Malaysia. The result of the case study shows that the history of health campaigns in Malaysia shows a gap where there were no campaigns that aggressively publicize obesity health issues especially among children. By looking at the gap, all the poster designs that had been publicized from 1991 to 2009 focusing on *diet behavior and physical activity* had been analyzed for data collection. The visual analysis had been done through the poster design by four countries with the highest rate of obesity in the world (Figs. 64.2 and 64.3).

On the other hand, from the *focus group* session, the researcher had produced an outcome that some of the factors contributing to childhood obesity today based on the arguments pointed by the focus groups are a *lack of awareness, lack of health related information, unhealthy diets, and lack of physical activities.* Four out of ten agreed that a lack of awareness was the major contributing factor of childhood obesity. Three out of ten agreed on poor eating habits, and another three out of ten agreed that lack of physical exercise was the other contributing factor [17–20]. The conclusion that can be made from the discussion is that most of the participants agreed that there is an overall *lack of awareness on childhood obesity*, and the poster design should educate parents and children alike on how to eat healthy and at the same time encourage their kids to perform light exercises [21].

From the first set of questionnaires, four questions have been prepared and distributed asking about problems in the recent poster design, and fifty have responded to the online survey. The target audiences are parents with kids, and 60.8 % of them stated that they "not familiar with the campaign poster," and 86.3 % of the respondents had answered "not attracted to the poster." The reason *why they were not attracted to the poster* is mostly because the *message conveyed is not clear*

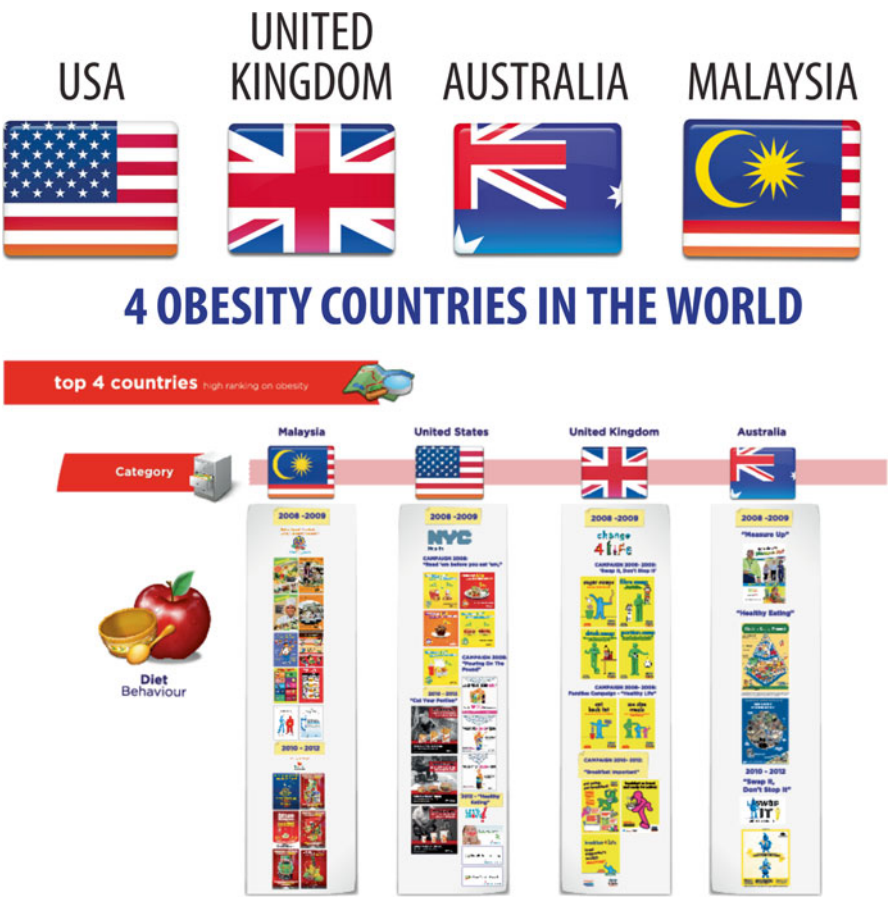

Fig. 64.2 Timeline of Ministry of Health (Malaysia) health poster campaign from 1991 to 2009

with 24.6 % and 23.2 % of them claimed that the *lettering is not big enough* [22, 23]. Basically, when the campaign is running, would they give their attention to the poster, and will they change their lifestyle and health? And most of them stated "no" with 84 %.

Looking at the second sets of the questionnaire, the visual icons that will be used in the poster design must be familiar to the target audience. In this questionnaire, the parents have to answer the survey by choosing the icon that is most suitable to be placed on the poster design. These icon symbols are very beneficial in any poster design to deliver good and correct message to the audiences [24–26]. In comparing between parents' survey results, about 56 % of parents voted for an apple as the popular fruit icon. On top of that, 48 % of parents considered fish as the most suit-

Fig. 64.3 Poster classified according to obesity causes from top four countries with the most obese people in the world

able protein icon to be on the posters. 47 % parents voted, respectively, on the vegetable icon of broccoli that is suitable. In terms of the grain icon, 58 % of parents chose rice as the icon they are familiar with. The results analysis continues with 68 % of parents agreeing that English should be used in the poster design. About 84 % agreed that the icons of the plate, fork, and spoon symbolized as universal icons for eating utensils. The respondents also agreed on vector illustration elements that 60 % votes were from parents and 71 % votes were from designers.

By reviewing at the five suggested multicolor poster designs as shown in Fig. 64.1 above, the viewers had been asked on which was preferred to be the main poster: 48.2 *% preferred Design 2*, and *83.9 % of them stated that the posters attracted their attention*. Due to these answers, *27.6 %* of them claimed that *the message was immediately conveyed and clear*. In addition, 25.5 % said that the poster has legible *typography* and it is *big enough to read*. Supported by literature review, "designing a good poster must be 'easy to read', direct or immediate and backed up with visual simplicity". Parents with kids responded to a question – are the posters giving you attraction on healthy eating, and will it change your life to healthy lifestyle? 60.7 % said that *yes* the poster can *attract the viewer on healthy eating and might change their life to be healthy* [27]. Referring to Fig. 64.2 the researcher asked them how effective the previous poster campaign is compared to the proposed poster campaign to which 70 % of them said that the proposed poster design campaign is very effective (Fig. 64.4).

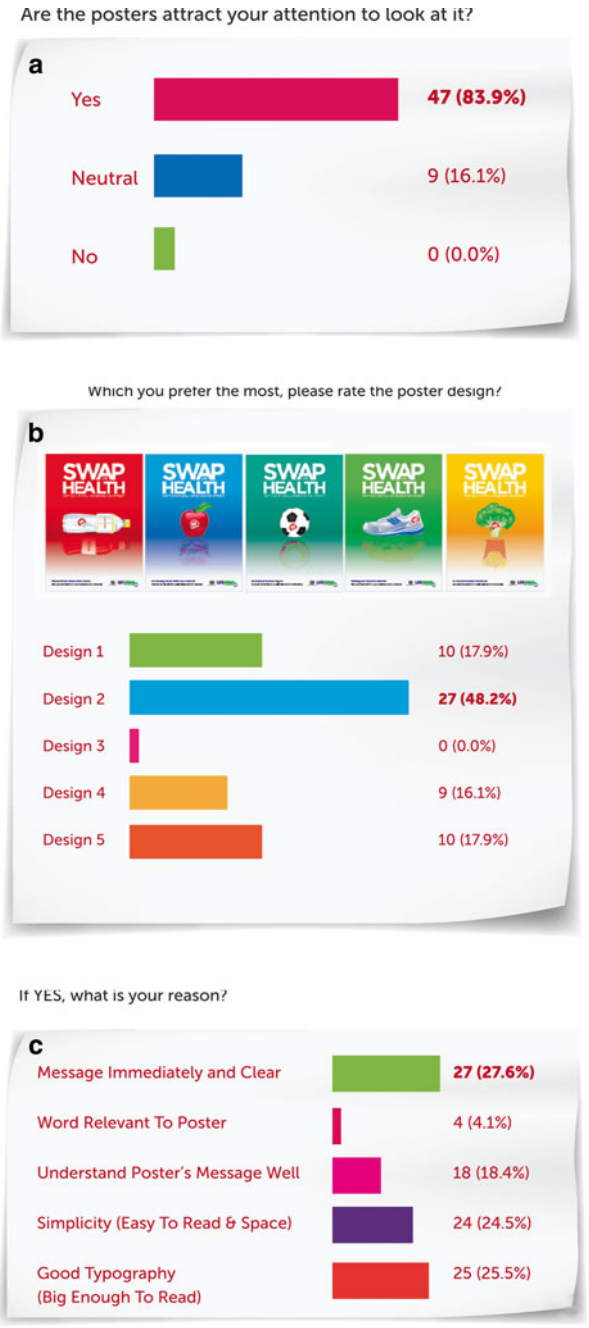

Fig. 64.4 Bar graph toward online survey result (**a**–**c**)

64.4 Conclusion

As a conclusion, this study is predominantly about the parents' perception toward the previous poster design. This study had identified the visual elements and criteria in developing an effective poster design. This had been supported by 100 young parents as respondents where the survey result showed that 70 % of them said that the proposed poster design is very effective. Thus, all the parents' perception toward the proposed poster design is positive and could be implemented in the present obesity campaign addressing especially childhood obesity. On the other hand, the obesity campaign poster design had been visually analyzed comparing with the previous obesity campaign poster design by the top four countries with the highest rate of obesity. The parameter of the visual analysis is focused on the design elements to improve the poster design as supported by Girard [19] in that the poster design should be analyzed based on color, font, title, blank space, size, and visual aids. Traditional poster design is becoming scarce. The advent of modern electronic media could help to provide a variety of interesting features on the poster so that it is able to communicate effectively. Designers should cultivate creativity through innovation by improving the utilization of specific visual elements on posters [8, 10]. In the future, it is hoped that graphic designers can be more innovative and creative to improve poster design.

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Chapter 65
Design of Prayer Room in Shopping Mall: A Feasibility Study

Abu Bakar Abd. Hamid, Mohd Zafrullah Mohd Taib, Mohd Hanif Abdul Wahab, and Aida Alias

Abstract Malaysia is a developing country moving towards rapid urbanization. Thus, economic development, human capital, education, and transportation are crucial in inspiring people to live in a much-improved environment. In addition, the emphasis on religion and spirituality is similarly given with high priority. In Malaysia, Islam is the official religion, and the majority of Muslims pray at a prayer room or house of worship. However, specifications and standard guidelines in designing the prayer room are not in accordance to Islamic teachings. This paper focuses on the significance of design elements of a prayer room in shopping malls. Users often complain of inadequate size and narrow space when performing a solah. Hence, design standards should be considered and referred to the local council. In this study, collection of data establishes the problems in the design standards and specifications of the prayer room. The study also identified several discrepancies and variations in prayer room design in shopping malls. The methodology involved observations, measurements, and interviews to investigate and analyze users' comfort. This study is important for local authorities and designers to determine the importance of user's comfort with regard to using the prayer room in shopping malls. The outcomes of this study is using to improve the design standards in the prayer rooms at shopping malls to approved by local authorities.

Keywords Praying space • Shopping mall • Islamic architecture • Islamic guidelines • Service quality

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65.1 Introduction

A prayer room is the most important place for the Muslim community in fulfilling solah five times a day whenever they were in a shopping mall. The concern of the Muslim community of having adequate solah space is something that needs to be emphasized, especially in terms of cleanliness, location, room size, and comfort while praying. This fact is supported by a number of verses from the Quran, and hadith exhorts Muslims to pray in a clean and comfortable environment. In this study, the space dimension, and users' convenience in prayer rooms in will be identified. There will be further analysis according to the specifications and standard guidelines set by the local authority. According to [8], the principal function of the musalla is the performance of communal worship for both men and women. The designer would need to incorporate to designed the plan for the musalla such as fulfills its primary function of social inclusion. A well-designed plan can enhance harmony, scale, balance, and composition of the musalla. The presence of a mosque is very important for the Muslims' devotion to Allah as argued by [12] because without mosques, Muslims are going to neglect the congregational prayer (solah).

65.2 Problem Statements

Most prayer rooms in shopping complexes can accommodate a small congregation of worshippers. The small, narrow space provided may cause discomfort and uneasiness when performing the prayers. During peak hours, an overflow may result for those awaiting their turn. The congestion may cause unwarranted conditions such dampness, moist, and unpleasant odors. Furthermore, the location of prayer rooms is far thus making it difficult for visitors to locate. Standard requirements introduced by local authorities such as the spatial size and prayer facilities were not fully implemented.

The five daily prayers are of great importance to practicing Muslims. Therefore, the mosque (a Muslim house of worship) or prayer room is considered to be one of the most crucial facilities for Muslims [13]. However, there are has been a lack of research on the religious attributes of the prayer room as the center of worship in public places and its impact on a user's choice and satisfaction.

In Malaysia today it has been made mandatory that public places provide prayer areas to accommodate the Muslim population. According to [14] in a predominantly Muslim country, Islam, through national culture, influences organizations. For example, [6] also found that all organizations in Malaysia placed a great emphasis on worship and had a prayer room. This idea has expanded into commercial industries such as shopping complexes which have allocated space facilities for Islamic worship and prayer, i.e., the musolla.

However, proper standard requirements of a prayer area or musolla provided by local authorities have not been abided. Consequently, problems such as accessibil-

ity, space congestion, air circulation and ventilation, and moist and damp conditions have resulted. Thus, this research attempts to study the condition of prayer areas in shopping complexes in Klang Valley. Results will be analyzed to improve and set up a proper set of guidelines and references in determining a standard requirement for prayer areas in shopping complexes.

65.3 Literature Review

Followers of the Islam religion are estimated to constitute 20–25 % of the world population. Islam is the religion of the majority in about 40 countries [6]. Almost every other country in the world has a minority group that follows Islam. As a relatively high percentage of Muslims regularly practice their religious duties, including prayers, there are always needs to design, build, and maintain mosques in various parts of the world [10]. Many designers, who may or may not be Muslims, are assigned the task of designing either a mosque or as in many Islamic countries a prayer facility that is part of a shopping mall, an exhibition hall, an airport, or another public building.

Shopping complex developers struggle to provide efficient and luxurious facilities for visitors. These attempts may distance society and religion because luxury and modernization are considered to conflict with faith and obedience to God [1]. The creation of an environment conducive to religious activities through the integrated construction of musolla in modern public places has the potential to balance the secular and religious realms. A musolla literally means a place where prayer is performed, where congregations are held, or a temporary place in which worshippers congregate to perform their prayers. A musolla may also indicate a place that has not been made an endowment or not yet intended to become a permanent masjid. Musolla are usually found in public places which are set up by local authorities.

According to Syafiq Basri, as cited by [2]: "Modernization is often considered the cause of religious influences' retreat, disengagement from society, and the erosion of faith and religious behavior by secular circumstances. Hence, public facility developers ought to help to verify that the process of modernization for consumers is not intended to distance them from religion. By providing modern musolla, public facility developers are not only helping the implementation of religion enforcement but also implementing their social responsibility for society."

The interaction is between the distinguishing attributes of sacred and profane spaces such as the musolla and ablution vestibule; the accommodation of men and women, by contrast, can provide a basis for establishing suitable settings for the needs of the faithful and thus define specific spatial conceptualizations into built architectural form [7]. The ablution function involves cleaning with freshwater certain parts of the body in a certain order. It starts with rinsing the palms, rinsing the mouth, washing the nose by sniffing, washing the face, washing each arm up to the elbow, wiping the hair with wet hands, rubbing the ears with wet hands, and, finally, washing the feet up to the ankle [9]. A full comprehension of the ablution space

requirements is difficult without shedding light on some essential concepts regarding the nature of Muslims' prayers. These concepts are particularly important when the designer is involved in defining the area for prayer spaces and relative to it the area for ablution spaces [10].

The Concept of Clean "Taher" Zone

The possible relationships between the prayer area and the ablution area are important in designing considering circulation and access to mosques and prayer areas, design-wise known as the "clean zone." This definition are elaborate of keeping the prayer space free of organic traces, bad smells, and other things that either render the prayer space unsuitable or annoy those who are praying or sitting [10] (Fig. 65.1).

Design of Ablutions

The ablution unit is the place of the ablution space where a single user performs the ablution process. The design should avoid elements that prevent the user access to areas that are difficult to clean. The presence of water will facilitate the growing of bacteria. Users should not bend their backs or knees in an unusual way [10]. The design should consider the elderly and sick users. Necessary accessories such as hand supports (e.g., handrails or shelves) should be installed to help people in standing and sitting. Shelves and clothes hangers should be provided. The design should prevent the water from splashing on surfaces that may end up on users' clothes. The

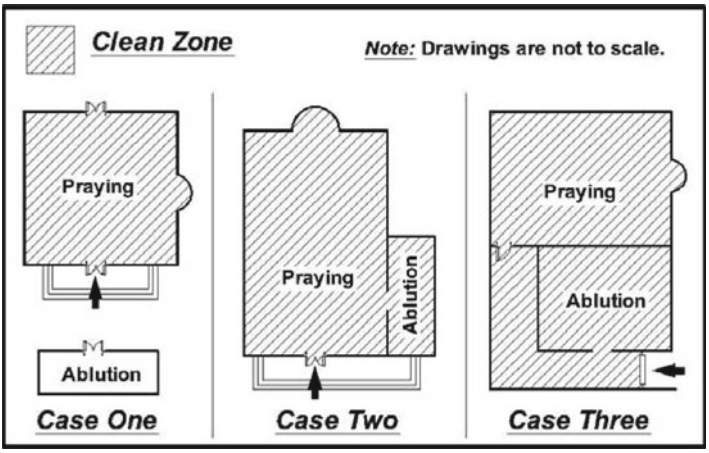

Fig. 65.1 Physical relation to praying space (Source: Mokhtar 2005)

design should reduce the wetting of surfaces that are in contact with the users [10]. Therefore, the creation of an environment conducive to religious activities through the integrated construction of musolla in modern public places has the potential to balance the secular and religious realms. The design of a prayer room (musolla*)* is also affected to a great extent by several factors such as costs, materials, and the impulse to embrace tradition and/or modernity. In fact, the demands in cost can often overpower all other parameters of design.

Musholla Design

A location for the users activity that has been planned and included as an integrated part of a building, like other facilities such as parking lots and restrooms. SenCi, like other malls of its class (such as Grand Indonesia, Pacific Place, Pondok Indah Mall, and Gandaria City), has a modern musholla [2]. An explanation of the form of a modern musholla was provided during a talk with Handaka Santosa about the special plans for the musholla in SenCi (Fig. 65.2):

> Since the beginning, we already owned a decent and proper musholla that had been specially designed and planned in the first place. So it was unnecessary to find a vacant or "left-over" space or area for the Musholla after the mall had been built. SenCi was one of the pioneering malls that took the musholla design seriously, with modern design, putting convenience and comfort first, and separate prayer rooms from other places that can be a distraction. Places like karaoke and entertainment are in different locations.

According to [4], shopping behavior is the most unique form of behavior which the consumers exhibit. Shopping for gifts, clothing, groceries, and household items are some of the most common activities that consumers indulge in a highly frequent manner. But according to [5], occasion and motives are also some crucial points which influence the consumers' shopping behavior. For example, for some consumers, shopping is all about getting the best deal out of bargaining, for some (especially teenagers or the young crowd) shopping is a means of getting acquainted and inter-

Fig. 65.2 Musholla room at SenCi mall (Source: Antara [2])

Table 65.1 Display three (3) main aspects incorporated the truly and functional of surau for Muslims

A surau to an individual	A surau to a community	A surau to its environment
A place of solace	A place for gathering	A place for shelter
A place to seek refuge	A place for learning	A place to complement nature
A place to find inner	A place to conduct	A place to begin or continue a journey
place	discourse	of righteousness
A place to rest	A place to fulfill duties and	A place to balance the elements
A place for physical and	obligations	A place of harmonious composition
spiritual cleansing	A place to express	and tranquility
A place of humility	A place to celebrate and	A place of serene juxtaposition
	solemnize	between creation and the created
A place for reflection of	A place to mourn and take	
one's deeds	heed	

Three main aspects incorporated the truly and functional surau

acting more with others in a social context, and for some it is a way of breaking out from the regular monotonous professional and personal routine [11].

Wakefield and Baker [15] found out that the architectural design of the mall was a factor which contributed the most to the mall excitement, while a mall's interior design had the strong influence on customers' desire to stay longer inside the mall [14]. They also found a positive and strong relationship between the mall's layout and desire to stay/mall excitement. This tells us that customers not only evaluate the product assortments inside the mall, but they also do look for the intangibles that the mall offers like colors, ambience, fragrance, lighting, and music.

The requirements for solah require a clean, carpeted (comfortable) area that would allow various prayer postures to be performed with relative ease and without obstruction or inconvenience to spiritual concentration throughout these four primary positions: standing, bowing, prostrate, and sitting.

For a truly effective and functional surau or musalla design approach, three main aspects and interpretations of the surau must be clearly understood and integrated [3] (Table 65.1).

65.4 Research Methodology

The methodology approach used in this study is qualitative (observation and surveys) probably enhanced with exploration method. The methodology is divided into three phases. The first phase will be the pilot surveys and gathering of data from other areas of studies related to research through interviews [16]. The second phase will be the gathering and collection of literature reviews (primary data) and interviews and case studies (secondary data). These involve drafting out research information or material or data relating to the scope of research on the theoretical aspect, policy aspect, standard authorized aspect, design aspect, and practical aspect. The third phase will be the field study which includes survey activities:

1. Interviews, observations, and consent of the users – structured and unstructured interviews of the focus group, mainly the users
2. Surveying the area and identifying the shopping complex in its comfortable context and the circulation of musolla area
3. Case study
   (a) Observation, site, and spatial study and inventories
   (b) Surveying the chosen shopping complex using the formulated survey forms in identifying the musolla of each space in a shopping complex
4. Photographs of measured drawings

Based on all of these, the findings to a certain extent will be explored before a synthesis is made to produce the conclusion. Recommendations will be made towards steps in achieving world recognition. Hence the writing up process of the final research report.

65.5 Feasibility Study

In this study, Plaza Masalam, Shah Alam, will be taken as the subject of this case study because this mall is the main location the public visits for shopping. In Plaza Masalam, there are several shops and boutiques. There is also a moderate-sized giant supermarket that is the focal point for people to buy groceries, food products, and other goods.

If viewed from the position, the Plaza Masalam building is so strategically located in the city center and is surrounded by residential areas, offices, and commercial areas of the elite class. It is not surprising Plaza Masalam is one of the chosen shopping complexes in Shah Alam and a place for people to buy the essentials that are easily available in the mall.

The facilities provided are quite comprehensive and are very well. Among them are bank's ATMs, foreign exchange counter, public toilets, car parking, prayer room, and other facilities. In this study, the scope of the study focused on existing prayer room facilities. The prayer room has two spaces: level two is for the men's prayer and level three for women's prayer. In this study, respect, comfort, and satisfaction are taken into account in determining prayer room design standards. Measurements were taken and space data were used. Basically, the prayer room dimension are 2,400 mm wide and 6,000 mm length, while the ablution room dimension was 2400 mm length and 1,500 mm wide (Fig. 65.3).

On Fig. 65.4, the diagram shows the situation when the congregation was in the prayer room. It was observed that the limited space causes other pilgrims to wait another congregation to complete his solah. Limited and narrow spacing has limited the number of pilgrims to perform solah. The gap spacing distance is 300 mm (1 feet) at the back is relatively narrow and made it more difficult for the congregation to move if there is an empty space at the end of solah.

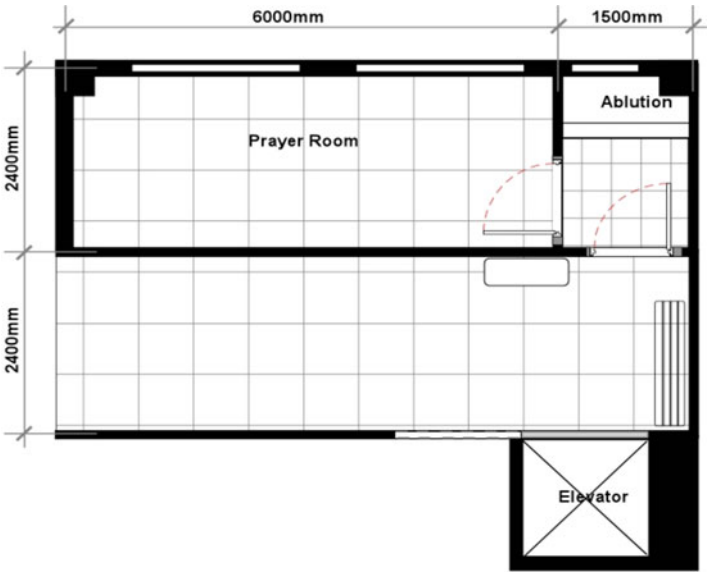

Fig. 65.3 Male prayer room at level 2 Plaza Masalam (Source: Abu Bakar Abd Hamid)

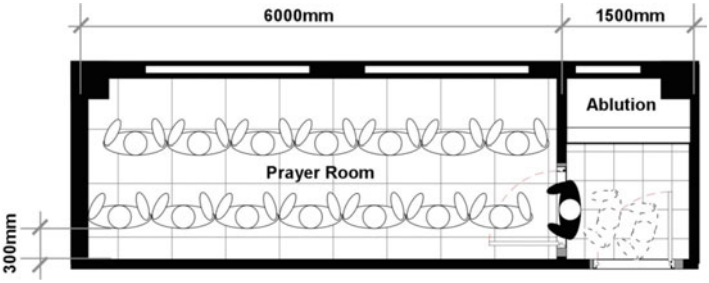

Fig. 65.4 Prayer room layout plan (Source: Abu Bakar Abd Hamid)

For the ablution space, only two (2) persons are able to take wudu at the same time. This causes the users to queue for a long time during peak hours. The congregation at some time will be queuing outside up to the elevator (see Fig. 65.3). The ablution space located adjacent to the prayer room caused wet and smelly floor. After taking ablution, the congregation goes inside the prayer room. Because the prayer room has carpeted floor, the wet floor produces an uncomfortable smell. From the general public view, the musholla should display the main external architectural features of the edifice and should reflect the sanctity of the faith. In this regard, the architect should avoid ostentatious use of forms, surface treatment, and decorative patterns. The proposed space distribution criteria for calculating the size and dimensions of the sanctuary including the women prayer place and the other necessary elements should be carefully studied and approved by all the congregants.

Purification (ablution) – perhaps no act is more important than the act of prayer itself. Ablution is the key prerequisite for prayer. The emotive act of performing ablution is no more and no less the setting that prepares the worshipper for the experience of a whole series of ritual movements: standing, bowing, prostration, sitting, and reading the sacred text. The ablution space is therefore a public ritual space as well. Therefore, the location and configuration of the ablution area are inextricably linked to its vital role; it should be planned very carefully. The prayer room should be designed esthetically valued with the effort of inducing participation of male and female worshippers, that is, to coerce active involvement in the ritual process.

65.6 Conclusion and Recommendations

Effectiveness and importance in the design of a prayer room are the main things in providing convenience and comfort to the user, especially the Muslims. In conclusion, comfort and design of the prayer room following the standards can give satisfaction to consumers, especially in shopping malls. Sensitivity of the local government in addressing this problem can be solved if all parties are concerned and sensitive to the issues related to the use of prayer room in a shopping center.

Recommendations in this study are that the standards associated with the design and comfort of the prayer room will be implemented and reinforced by the local council. For new building construction, the local council shall require the architect and developer to design a wide and more comfortable prayer room which can hold a large number of users during peak hours. Any proposal must be reviewed by the local council before making any decisions related to the design of a prayer room.

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Chapter 66
An Innovation of Traditional Malay Singgora Roof Tiles in Modern Architecture

Zulkarnian Hassan, Mohd Shahrol Hanafi Mohd Raffie, and Siti Norlizaiha Harun

Abstract In Malay traditional architecture, one of the most distinguished parts of the structure is its diversified roofs that carry their own identity. Roof designs are influenced by factors such as nature. The roof promotes air circulation and ventilation, provides influx of natural lights, and filters the sun rays and rain sprays, and it also has a design that is energy saving. Singgora roof is a heritage architecture which keeps its Malay traditional features. Singgora is derived from a Malay word that means The City of Lions, but physically, it resembles fish scales. These roofs are made of clay and molded by using both legs. They are mainly used in the East Coast states and Thailand. Singgora roof tiles are hardly being used now due to its problems such as material supply, quality, fungi, and life span. Conservation efforts on Singgora roof also take a long time as they involve processes such as taking them out, giving them treatment, and replacing and then putting them back. Moreover, these processes require a lot of money and specific skills. Thus, the objective of this research is to focus on the production of Singgora roof tiles, method of installation, and main ingredients as well as to provide solutions and new ideas or concepts in modern architecture to sustain its heritage so that it remains significant in the Malay culture.

Keywords Malay traditional house • Singgora roof tile • Culture • Conservation

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66.1 Introduction

Malaysia is rich in historical heritage which can be found in buildings, monuments, and historical sites. Many heritage buildings in Malaysia maintain their Malay traditional features as can be seen on palaces, mosques, or Malay houses. All these buildings have their own uniqueness and elements of exquisiteness on certain carvings [1]. One of the significant elements on Malay architecture is shown on its roof designs. Roofs complete the design of a house as they offer shelter to its body and become the symbol of ethnic background and beliefs [2]. Malays in the East Coast usually own houses with long roofs, while the Malays in the West Coast are known to have "limas" roofs or also known as "perak" roofs on their houses. Each state in Malaysia carries its own roof identity which is unique and based on some historical facts. The type of the material, roof tile shape, and method of installation also contribute to aesthetic values and architectural style of a building. However, modernization and technology have also succeeded in producing high-quality and durable material from concrete or asbestos tiles which are widely used in this era. Traditional Malay houses which still use clay roof tiles are known as Singgora roof. Singgora roof or "Singgora bricks" (as used by the Kelantanese) is the type of roof design which originates from Thailand and the tiles are manually produced. It has become part of the Malay traditional architecture after the process of migration, trading activities, and high demand from Malaya circa in the early eighteenth century by the Thai communities [3].

However, the use of Singgora roof has declined since 1977. *Mek Jah*, the owner of *Kraf Atap Singhora* factory, runs the last factory which still produces Singgora roof tiles at the moment. The problems involved in the production of the roof tiles are the unavailability of materials and a decrease in demand for Singgora roof. In addition, the emergence of new roofing materials such as asbestos, zinc, and concrete has become a major cause behind many other Singgora factories that have ran out of business (Fig. 66.1).

Fig. 66.1 *Mek Jah Kraf Atap Singgora, Bachok, Kelantan* – the last Singgora roof tile factory

Demand for Singgora roof still exists even though the number has significantly reduced. Thus, *Mek Jah* decided to pursue her business. Orders are received throughout Malaysia, especially Kelantan and Terengganu, besides Thailand. This clearly shows that the majority of the demand for Singgora roof tiles comes from the East Coast states. This is because most of the houses that use Singgora roof can be seen in these parts of the nation; furthermore, they are near Thailand, where the historical beginnings of Singgora roof can be traced before it came to the Malaysian shore.

Before *Mek Jah* started her factory, the original workshop that was in charge of the production of Singgora roof tiles was owned by her late father and was located close to the *Kemasin* River. According to her, during the 1960s, there was no access to land for the purpose of collecting clay. Hence, her late father built a garage on the edge of the river, which also contained all the production process in making Singgora roof tiles. Starting from 1973, there was road access, and *Mek Jah's* factory was moved to areas near their homes until now.

Mek Jah's factory is now registered under the name of her son Mohamad Adik Jusoh with the official name the Singhora Roof Craft. The processes of producing roofing sheets are still conducted traditionally. Most workers are women, and the average age of their employees is in the range of 40–55 years. Age, however, is a factor that does not influence the production process because the employees are capable of producing about 35,000–40,000 tiles in all combustion processes.

This clearly shows that the industry of Singgora roof tiles is relevant until now and it just requires a few intervening efforts in terms of promotion, marketing, research, quality of the materials, and the use of technologically advanced equipment and provides training opportunities to those who are interested. The use of Singgora roof tiles now is rarely seen on traditional houses or mosque and *waqaf*, but it has been the choice of luxury homeowners in areas such as Kemensah Indah, Kuala Lumpur.

66.2 Methods

The methodology used in this research has been through the process of designing a plan of study which includes qualitative and quantitative research. For quantitative studies, it involves surveys, observations, and interviews conducted with a number of respondents and analyzes relevant findings of the research. For the qualitative study, a pilot experiment was conducted to obtain data on the main ingredient, strength of materials, and the proposed end use of the material for the Singgora roof tile conservation process. All data obtained are used to launch the review process as a means of obtaining authentic and transparent information in each section of the study. The quality of the main material which is clay is tested to improve the level of durability for each roof tile. It is carried out phase by phase through original samples of clay (local and new formula) to reach maximum strength. The new added material which is known as "grog" is used to fortify the clay taken from paddy fields. Grog is the remains of secondary clay which is taken from the paddy

field and rivers and dried, baked, and crushed according to suitable grades using a jaw crusher machine.

The material is then put into the mixture of original clay based on the predetermined percentages, and the result on the sample shows that the new added material strength can reach up to 20 % more than the original clay. In order to add value to the unique effects of the Singgora roof tiles, ceramic colors such as oxide are used together with the mixture to produce different colors for each roof tile. Materials such as red iron, black iron, copper, and cobalt are among the additional oxides added into the mixture of Singgora clay before it is being molded in the mold.

Another improvement is the use of a layer of glaze which is satin or semimatt. It is believed that this is to overcome the issue of fungi on the surface of these roof tiles [4] rather than using an antifungal agent in some conservation procedures. A layer of glaze has been identified as giving protection for each of the Singgora roof tiles, and it has the ability to reduce the problem of tile cracks. At the same time, it will reduce the effects of wear and tear or any flaw on the Singgora tiles. This is an alternative to the sustainability of Singgora roof without compromising its original heritage features. It also fulfills the goal of conservation process to preserve heritage materials and the look as well as keep them for the future generation.

Nevertheless, some people in the society believe that this approach is not suitable and will cause the increase of Singgora tile prices per piece. However, from the observation done, it shows that Singgora roof tiles (RM0.60 per sheet) are cheaper than other materials. Here is a flow chart of the research design which includes the study and the objectives.

66.3 Result and Discussion

The Uniqueness of Malay Singgora Roof

Singgora roof tiles are still getting high demands especially among the East Coast communities such as in Kelantan. Uniquely, the tiles are produced and pioneered by women who have started this business long time ago (Fig. 66.2).

In addition, the most unique feature of these roof tiles is the method of production which is using both human legs. Based on the studies, there are similarities between the processes in producing Singgora tiles and the traditional Malay massage which used legs as part of the method in massaging the body [4]. Both methods are pioneered by women. One of the unique features of Singgora roof tiles is that it is made of clay which is taken from the paddy field or rivers where the amount of salt available fortifies the clay and makes the process of kneading easier. In addition, the content of salt in the clay is believed to increase the rate of strength after it is baked. The function of salt in the clay content is to add structure strength to the soil particles.

The clay is then kneaded using the legs by stepping on piles of soil in a certain area, and later it is molded and baked to produce strong tiles at the temperature of 700 °C–1,000 °C. People in the East Coast areas called them “bata” (bricks) because

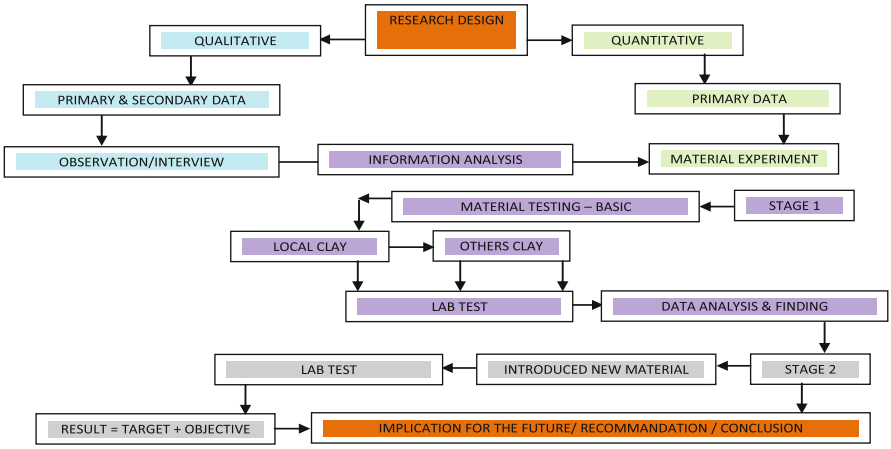

Fig. 66.2 Research design

the color of Singgora roof tiles turns to red after it is baked which resembles the color of the regular bricks. Some of the tools used in the production of Singgora roof tiles are wooden mold (*sarang bata*), wire cutter (*pengerat*), paddy husks (*sekam padi*), bamboo ruler, wooden paddle, and traditional brick kiln. Singgora roof tiles will go through the drying process before they are baked for 8–10 days using the rubber trunks as source of fuel.

Malay communities in the past favored the use of Singgora roof because of its special ability to cool down the interiors of their houses. The cooling factor is due to the natural characteristic of clay. It could absorb rain and turn it into a cool refreshing air. A theory which was propagated by Zainul Abidin Hassan [5] explained that the effect of water when it met the surface of clay was evaporation.

In terms of physics, the cooling of water on the surface of clay is able to take place due to two processes which are the addition of surface for water and evaporation. Each surface of the roof tiles is porous and it enables water to go through it and meets the air. When this happens, the process of cooling takes place where water is turned into mist. Mist produced from this process is responsible in reducing the temperature of the house's interior and cools the air in it (Figs. 66.3 and 66.4).

Factors that Contribute to the Decline in the Demand of Singgora Roof Tiles

Even though the demand of the use of Singgora roof tiles for housing construction is high, ever since the 1970s, the material becomes a factor that limits its production. The main material which is clay taken from paddy fields and rivers is limited and

Fig. 66.3 The uniqueness of Singgora roof – kneading and forming using the legs

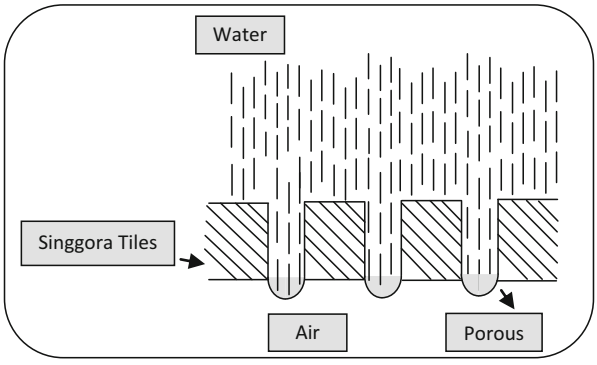

Fig. 66.4 Theoretical process of the cooling effect of Singgora tile

causes the reduction of demand for Singgora roof in Malaysia. Consequently, a lot of manufacturers closed their factories. Another factor is that the society preferred to use asbestos roof tiles or concrete fibers.

In addition, individuals today do not have a choice to buy houses according to their interest on Singgora roof tiles. In reality it will cost them lots of money if they want to change their roofs to Singgora styles. Meanwhile, the contractors themselves have been identified as one of the factors that cause the decrease in the use of Singgora roof tiles for new houses especially in Kelantan. They believed that the difficulty in producing the Singgora roof tiles and the quality of each piece will increase the cost of housing in the construction, and they refuse to use these clay-based tiles.

Furthermore, another contributing factor is the need for conservation activities on the Singgora roof after 3–5 years of its usage [6]. One issue that challenges the sustainability of Singgora roof usage is the surrounding effects on its surface and

durability. Factors such as humidity, rain, and heat as well as air pollution cause the roof tiles to fade, overtaken by microorganism or fungi and cracking on some parts of the tiles [7]. Unpredictable weather also causes the decline in demand among the society since the conservation cost is high.

Towards Sustainability of the Material

Clays in Malaysia is one of the best sources that can be used to produce a wide range of ceramic products. Clay is suitable for the production of products such as sanitary ware, tableware, pottery, tiles, etc. The states in Malaysia with major clay found are Perak, Selangor, Johor, Malacca, Terengganu, Kelantan, and Kedah. Clay is composed of two types, soft and hard form [8]. The quality of clay is different for each region according to the rate of clay composition (Table 66.1).

The clay used to produce Singgora roof tiles in Kelantan is taken from the clash of saltwater and freshwater at *Kemasin* River. The high content of sodium in clay is considered suitable and gives strength in producing a single sheet of Singgora roof tile, while other contents are the result of ferum oxides (FeO) in the soil organic matter which give the reddish color effect after the sheet was burned into a kiln.

The result showed that the highest ingredients which are found in Bachok local clay are silica and alumina. Both of the materials represented the body of Singgora clay base which becomes strengthened while it is fired into kiln. The reddish colors in Singgora body of clay appear from the material called Ferum/ion (Fe_2O_3) which approaches the clay body as a hold. After several experiments done on adding *grog* as an agent to make the clay stronger, the result showed that by adding 2 % of grog, the clay is stronger than the original clay.

For the preservation purposes of Singgora roof tiles, it can be summarized that although the clay material resources in the state of Kelantan are low, especially in the Kemasin River, it does not become an obstacle to the conservation of the Singgora roof industry. There are many other sources of clay in Malaysia with the quality and colors for the purpose. The process of obtaining material may be brought

Table 66.1 X-ray Fluorescence Analysis of Singgora Clay (Bachok, Kelantan)

Composition	Measurement	Spectrum	Result (wt%)
SiO_2	SiO	Si-1	49.4 %
Al_2O_3	AlO	Al-1	19.7 %
Fe_2O_3	FeO	Fe-1	0.80 %
CaO	CaO	Ca-1	1.50 %
MgO	MgO	Mg-1	0.27 %
K, Na	KO,NaO	K-1,Na-1	1.50 %
H_2O	H_2O	H_2-1	25.7 %
Others mineral	Error	Error	1.13 %
Total			100.0 %

into the state of Kelantan using appropriate transportation as is done by Malaysian factories that produce a product from the clay material.

However, some experiments should be conducted to provide the necessary characteristics such as clay from the Kemasin River. Quality of the materials can be improved for safety and shelf life and ensure the quality of the material produced. It is essential to sustain the production and acceptation of Singgora roof for next generations and to take care of the asset for Malaysian heritage.

Malay Singgora Roof in Modern Concept

Uniqueness and aesthetical values found in Singgora roof tiles have been the major values behind the continuous production of the roof tiles. Based on observation, Singgora roof contains high value to the Malays particularly those in Kelantan and Terengganu. They believe that Singgora roof can be maintained in the Malay society should it be given a new touch in the context of modern production. Singgora roof which is found mainly in old Malay houses, palaces, mosques, and others has to go through modern transformation by applying existing items such as gazebo, *pergola*, or *wakaf.*

In the proposal for innovation, the gazebo is chosen as an idea for existing buildings for the purpose of transformation for Singgora. A gazebo usually uses wooden materials as roof tiles as well as asbestos fiber or zinc. Suggestion for innovation and modernization which involves the combination of Singgora roof and gazebo or pergola can be a starting point for the society to accept it again. This is a relevant approach towards the modernization of traditional architecture that brings in a new style. This method is in accordance with the research done by Maria-Jesus Agost [9] in her studies that concluded that tile product marketing method has a close relationship with the fashion drive.

Of late, the society favors the use of gazebo or pergola in their landscape design to give sentimental values in their daily life. Modern features involve the use of different colors on every single piece of Singgora tile which is hoped to attract the society to bring back Singgora roof as part of their culture.

One of the efforts to modernize the Singgora roof tiles without leaving behind its cultural heritage is by adding elements such as bamboo *(Pucuk Rebung)* design patterns which are arranged on the whole outlook of the gazebo. It is hoped that this will entice the Malaysian societies to make Singgora roof tile and at the same time ensure the sustainability of its use in a modern concept (Figs. 66.5, 66.6, 66.7, and 66.8).

Prospect of Sustainable Singgora

Singgora roof has a wide prospect if its use is not limited to houses, mosques, and "wakaf." In fact, it will be more successful if it is applied to the construction of hotels, resorts, chalets, or other modern architectures to portray the identity and

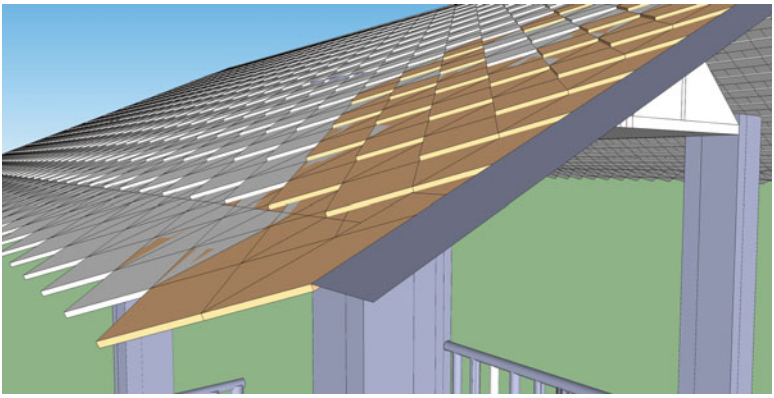

Fig. 66.5 An Illustration of the Singgora roof structure

Fig. 66.6 An illustration of a Singgora gazebo in the modern context

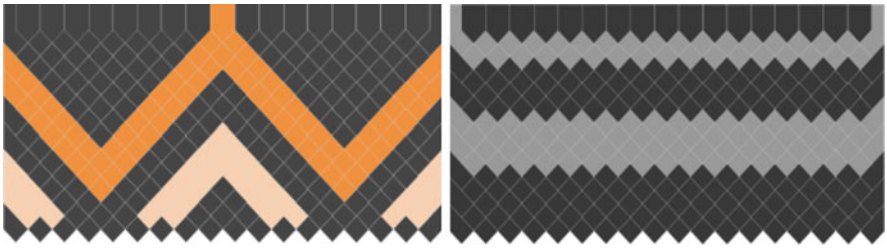

Fig. 66.7 Illustration of a *pucuk rebung* pattern concept applied on Singgora roof

Fig. 66.8 Prototype of the new Singgora in modern architecture – gazebo (Patent pending)

characteristics of Malay architecture. Sustaining the heritage must be in line with the objective of the Department of Malaysian Heritage which is to conserve, preserve, and protect Malaysia's cultural and natural heritage through research, documentation, and enforcement and encourage awareness [10].

Singgora roof which has gone through the process of transformation will be able to contribute a new prospect for its preservation. It is recommended to provide better opportunities to entrepreneurs of Singgora roof tiles to improve their economy value while adding at the same time the number of Singgora factories in Malaysia. The Department of Malaysian Heritage and handicrafts and tourism agencies will benefit from this proposal when it is applied in a wider form for the purpose of Malay heritage and sustainability development. To the general public, they will have the choice of using Singgora roofs in the modern form while still maintaining its unique features and aesthetic values.

66.4 Conclusion

One of the most important findings in this research is that maintaining the use of Singgora roof tiles is not difficult. However, it is limited since the source is depleting. Therefore, innovation and transformation which are crucial to ensure that the Singgora roofs are preserved in terms of shape are insufficient. It must also be given a boost in quality of the material used. The proposed innovation is similar to the original Malay Singgora roof. The suggestion is to come out with some innovative ideas based on traditional Malay Singgora. It is an effort to preserve national heritage for the future generation so that they will be able to recognize it and will continue using Singgora roofs in Malay architecture and culture. All the illustration and tables used in this paper are owned by the author.

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Chapter 67
A Hybrid Model of Drawing: Pictorial Representation of Visuospatial Attention Through an Eye Tracking Research and Numerical Logic of Lines

Shareefa Abdullah Al-Maqtari, Ruzaika Omar Basaree, and Rafeah Legino

Abstract A hybrid pictorial representation of visuospatial attention in art creation becomes a crucial issue in order to explore a new drawing technique development. This drawing technique development is straight related to an eye tracking research and biometric process that involved visual data analysis of eye movements, public behavior, and space-based visual attention features, which is the first study in a visual art field. A multidisciplinary approach will be used in this study through combining human eye movement analysis toward Paulikevitch's dancing and the traditional techniques of drawing. In postmodernism, visible and invisible theory, the challenge is to represent quality content of invisible concepts such as attention, sound, motion, and time based on a clear rational interpretation of specific properties of a form. In this paper, the researcher proposes an illusion model of a hybrid form of visuospatial attention based on the outcomes of combining among spotlight attention model by William James, pictorial representation through aspect- recognition theory by Lopes, and the numerical logic of linear style. The researcher will record the qualitative visual data using Tobii T60 remote eye tracking hardware and Tobii Studio analysis software set from a dark and bright pupil eye of ten international respondents to collect and analyze the participants' eye movements, male versus female when watching video clips, "Mouhawala Oula" and "Tajwal." The expected outcomes will be installation artworks that will represent a new perspective of illusion, hybrid pictorial of invisibility, which is an alternative approach of creation.

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Keywords Pictorial representation • Visual attention • Eye tracking research • Drawing • Illusion

67.1 Introduction

In the recent visual research, there has been an increasing interest to use multidisciplinary approach for exploring the features of invisibility through pictorial representation-based recognition hybrid theories as a crucial subject in the contemporary visual art inquiries [1–7]. Today, cognition theories attempt to ground a depiction hybrid approach for invisibility that represents pictorial reference by mental perspective of properties from which the artwork represents its objects. This adds another stage into pictorial representation of invisibility: illusion which is the latest step after detecting the object and visualizing its realistic properties. Lopes's theory of depiction—the aspect-recognition theory—is a well-known hybrid theory that embraces pictorial reference based on denotative symbol systems [5, 7]. In art, the latest studies reflected transferring of visual perception, communication, and representation from the desire of getting deep understanding of complex visual issues through critical inquiries into the challenge of embedding invisibility as a core subject. For more details, the explorative study of shaping sonic by [8], the visual representation of emotion for communication by [9], the critical investigation studies and the public representation in installation by [10], the documentary representation of painting in film by [11], and the visual representation of space by [12] are provided. Particularly, attention is a general invisible phenomenon that has been oriented deeply through visual investigation from neuroscience, psychology, psycholinguistics, ophthalmology, usability, human-computer interaction, and package design and marketing researchers to identify the mental properties of attention for biomedical and industrial design purposes [13–16]. They applied serial digital systems to visualize visuospatial attention maps through an eye tracking research to record and analyze the eye movement's data through fixation or saccades.

Indeed, suggesting a hybrid-art practices research to shape visuospatial attention using an eye tracking for illusion is too rare in art. Therefore, through this multidisciplinary study, the researcher will draw the hybrid form of visuospatial attention (HFOVA) toward redefining gender roles through oriental female stereotype dance according to three stages: (1) attention detection, (2) biologic visualization, and (3) illusion. Gaze statistic and visualization data will be combined within the numerical logic of linear style for shaping HFOVA. The conceptual framework of this study will be based on the combination of spotlight attention theory by William James and the hybrid aspect-recognition theory of depiction by Lopes. This study could be considered an alternative approach to visualize invisibility in art for creation debates and practices.

The Problem Statement

One major drawback of the recent pictorial representation studies of invisibility in outdoors is that there are conflicts with the principles of the visual representation theory. Most of those studies focused only on one standpoint of art and failed to embed the behavior states of public based on art element representation which is the main property of visual representation theory [17]. Moreover, they did not mention any specific hybrid or visual representation theories to support their hybrid theoretical or conceptual frameworks as [8, 9]. In attention research, human vision system depended on the evidence of saccadic movement to detect visual attention for scientific reasoning easily [13–16]. However, recognition of object and human gender interest in a complex movement scene is regarded as the most difficult task in artificial machines and too rare in art for creation and illusion issues [18].

The Purpose of the Study

Based on a multidisciplinary approach, this study aims to shape HFOVA of male versus female toward dance-based video of Paulikevitch's performances (Fig. 67.1). HFOVA will be generally defined as the hybrid shape that was created based on the combining method between an eye movement's visual analyses and representation of art elements through numerical linear style.

Objectives

- To define the hybrid features of visuospatial attention through combining aspect-recognition theory, spotlight attention theory, and linear-style properties based on literature review
- To generate visual, qualitative data of attention features from a sample male-versus-female test based on a respondent-generated visual data method using an eye movement analysis
- To create a hybrid shape of visuospatial attention based on the combination of findings from objectives 1 and 2 and linear-style research practice

Research Questions

This research addresses the following questions:

- What are the hybrid features of visuospatial attention based on combining aspect-recognition theory, spotlight attention theory, and linear-style properties?

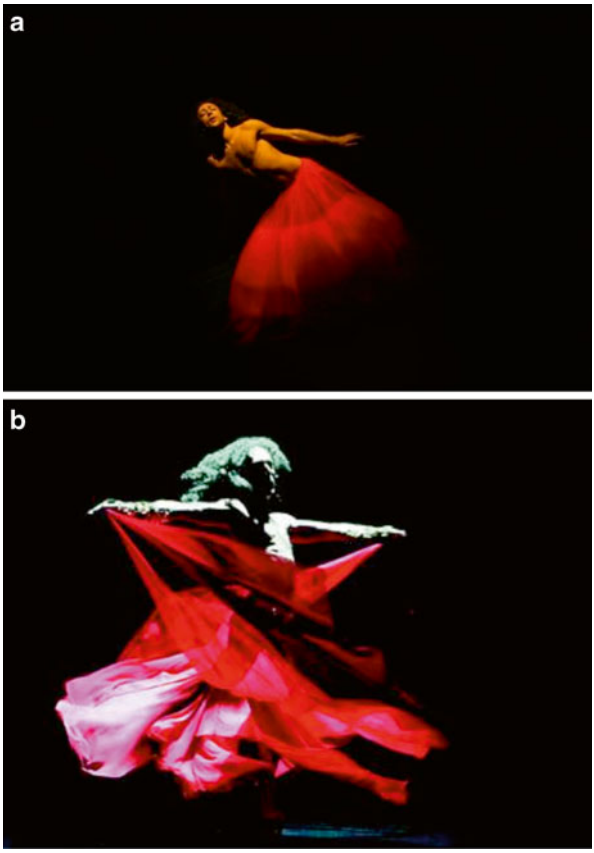

Fig. 67.1 The image of (**a**) Alexandre Paulikevitch's dance performance "Mouhawala Oula" and (**b**) "Tajwal"

- How can the visual, qualitative data of biological features of visuospatial attention from a male-versus-female sample in a complex dynamic scene be generated?
- How can a hybrid form of visuospatial attention based on the combination between the information of biological features and art elements using numerical linear properties be represented?

67.2 Methods

Design and Methods

The design of this two-phase collaboration representation method will record visual, qualitative results of visuospatial attention from a sample—male versus female—with the intent of using this data to explore the hybrid shape of visuospatial

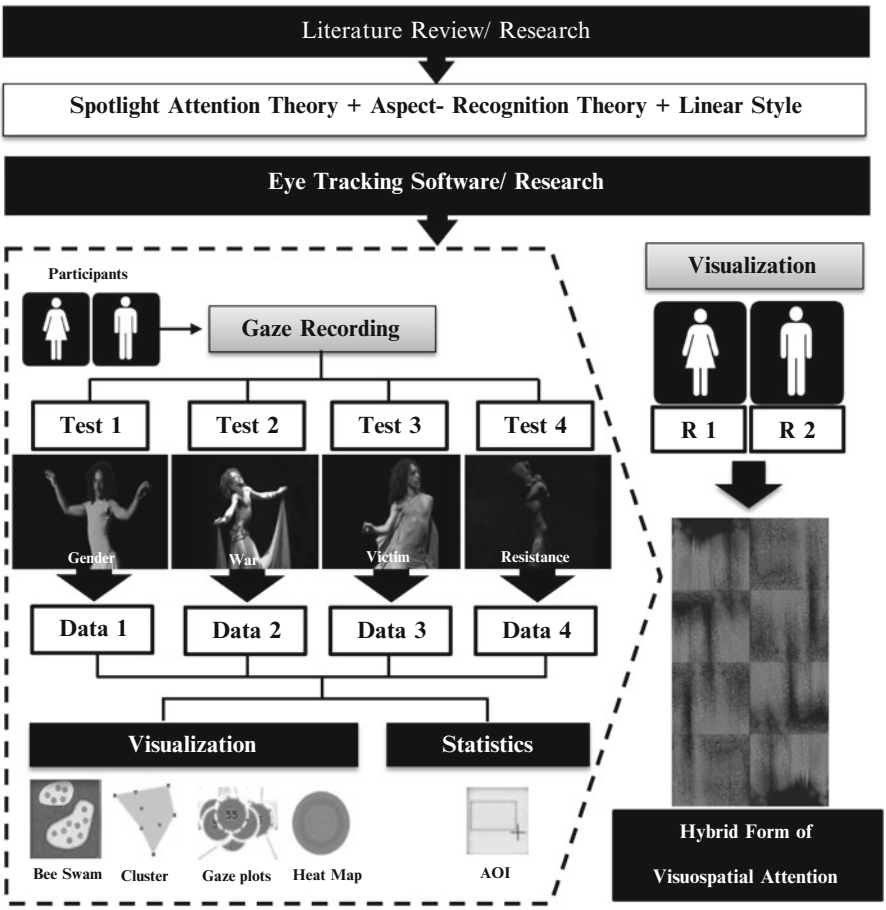

Fig. 67.2 Research design and methods

attention based on combining visual information with the art elements by applying linear-style properties. First, it will be a qualitative respondent-generated visual data method at the Culture Center Lab, University of Malaya, using a human eye movement analysis, which is the appropriate method of attention studies research [19]. Then, a created test design will be applied to generate visual data of visuospatial attention for both and separated genders. Audiovisual materials will be a Paulikevitch's performance-based video: "Mouhawala Oula" and "Tajwal" that are redefined gender roles through oriental female stereotypes dance. Second, biological features from qualitative visual data will then be developed into a hybrid shape based on numerical logic of linear style through representing visual research using art-practice research; see Fig. 67.2.

Respondent

Most of the previous studies adapted sampling techniques of the eye human movements tracking based on uniform random sampling method. Reference [20] claimed that vision studies would have been more useful if shuffling random sample technique was included. Therefore, the sampling size for this qualitative study will randomly select fixation from bright and dark pupil eyes of ten Middle Eastern international students ($N = 10$), five females and five males aged from 23 to 32 years at the University of Malaya.

Tools

The research will be conducted through remote eye tracker Tobii T60 Hardware, firmware version 2.0.7, TET server, Studio software analysis, and traditional techniques of drawing in Fig. 67.3.

Experiment Setup

The visual attention through human eye movement will be recorded using an infrared video-based remote eye tracker (Tobii T60) system and Tobii Studio software suite to capture and analyze the spectators' attention. The respondents will be asked to watch and focus their gaze in two video clips, including four different massage scenes, redefined female role dance, war, victim, and resistance (totaling to approximately 5 min). The viewing distance between the respondents and the center of the

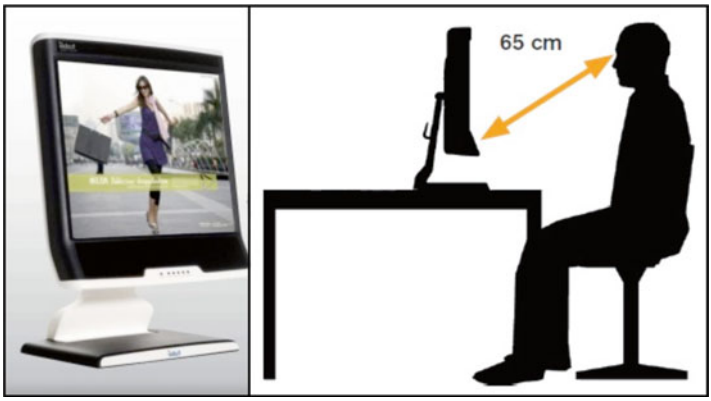

Fig. 67.3 Remote Tobii T60 system and Studio software analysis

track box will be set to 65 cm from the eye tracker. The stimuli will be collected from YouTube and stored at 60 Hz on the native TFT screen (1280 × 1024 pixels). First, the researcher will record the gender, age, and background information for each person, and then they will be asked to move their gaze on the calibration points. Second, they will be asked to focus their gaze on the four scenes when watching video clips.

67.3 Data Analysis Plan

This project will be undertaken in three areas:

Techniques

- Literature review/research: to identify HFOVA hybrid features, attention spotlight theory and pictorial aspect-recognition theory will be criticized.
- Eye tracking software/research: to measure a visual attention from gender, male versus female, the attention analysis computer software called Tobii Studio will be used. It will be applied to record the statistic data of gaze, fixation count, fixation length, time of the first duration, fixation duration, and visit duration with an area of interest (AOI) metric and then to generate the visual data of gaze with visual eye tracking metrics, gaze plot, heat map, and cluster. Eye tracking metrics results with both dynamic and static shows will present frame of each scene through segment technique.
- Visualization/creation research: to shape the hybrid features of HFOVA, the researcher will combine the spotlight attention features, focus, fringe, and margin, with the numerical logic of line characteristics, grid logic, measure of line, line types and qualities, line direction and location, line and art elements, line interpretation, line expressive language, and linear perspective, based on the aspect-recognition principles theory, pictorial references, identification-based information, constraints on thought, pictorial aspects, pictorial systems, pictorial recognition, pictorial meaning, and pictorial experience.

67.4 Illusion: Visualization Process

Actually, lines in mathematics are without width or ends; it is defined as the path made by a moving point. In the contrast, lines in art are measurable; they have width, length, as well as ends [21, 22]. The line's measurability character will become the main standard in this study to design the hybrid features of HFOVA project through applying the logic of number on line and edges by [23]. The HFOVA

project will consist of 30 grids (video clips equal five minutes; it will provide 30 frames, and each frame has 10 s through a segment technique). The hybrid features of HFOVA then embedded in a set of multiscale feature grids, intrinsic scale, fixation counts, and time stamps metrics to six classes of possessions, frame of grid, orientation, value, texture (intensity), and motion and shape of the structure. An intrinsic scale will be a line's qualities scale comparable with fixation's scales of quantities. Traditional techniques of drawing will be used to draw the sketches of 30 grids of each gender, in order to represent the hybrid structure of HFOVA according to a base theory of aspect-recognition and research self-art practices as follows:

Illusion of Hybrid Frame of Grid Feature

When formed into a grid frame, the number of parallel lines created with similar crosses will equal to the gaze count. However, the length of parallel lines will be identified based on gaze length result. For instance, if the gaze count based on AOI metric is restricted to about seven, the number of parallel lines will equal to seven in each direction. This will provide 36 squares. Similarly, the length of these lines is equal to 3 cm based on the gaze length if it is restricted to about three. This technique will provide various sizes of grids and will reflect pictorial unity with variety as shown in Fig. 67.4.

Illusion of Hybrid Orientation Feature

In art, linear perspective is used to portray three-dimensional objects in two-dimensional space. The farther or nearer the objects are based on a vantage point, the more apparent the spot from which the viewer observes the objects, that is, object orientation [21]. For each frame of grids, the line orientation feature will be the gaze plots; single view and order of fixation will be shown through the gaze plot visualization. Line qualities (thickness, thinness) will be defined based on the size of dots within fixation duration, as follows in Fig. 67.5.

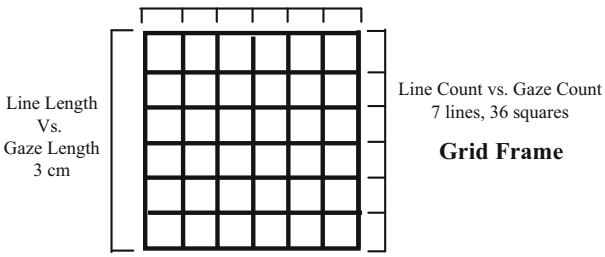

Fig. 67.4 The numerical logic of hybrid grid frame

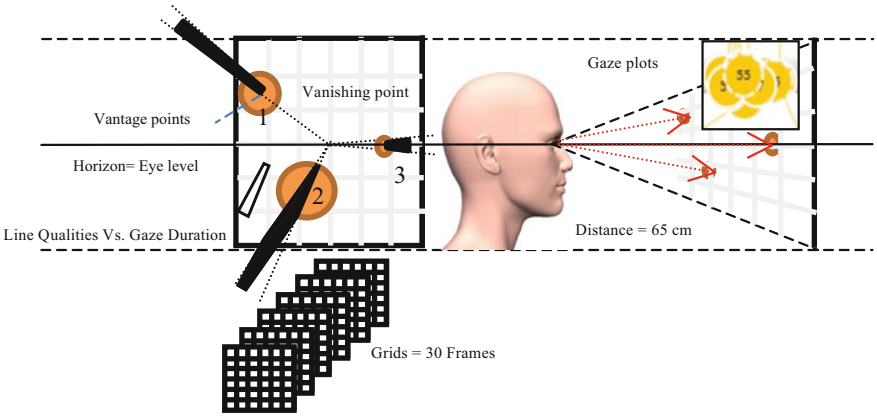

Fig. 67.5 Hybrid orientation feature: attention perspective

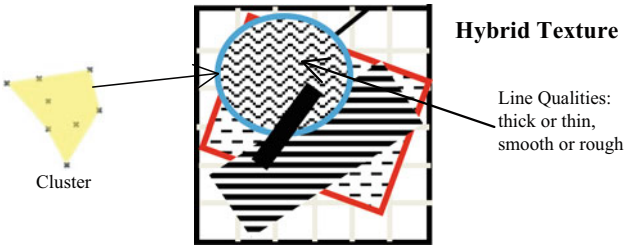

Fig. 67.6 Hybrid texture based on intensity

Illusion of Hybrid Texture (Intensity)

Texture is the surface fell derived from physical quality as experienced by touch sense [24, 25]. Illusion of hybrid texture will derive from line qualities, thick or thin and smooth or rough, based on the cluster visualization metric information. This metric will represent the intensity of areas with high concentrations of gaze data points, covered on background as shown in Fig. 67.6.

The Gradation of Value

The gradation of value from light into dark (shadow) is achieved by altering the density or measure of lines to become smaller along their edges [21]. Hybrid shadows of attention will be derived from the highest interest using the heat map visualization metric-based fixation count and line—bright area, from light to dark (Fig. 67.7).

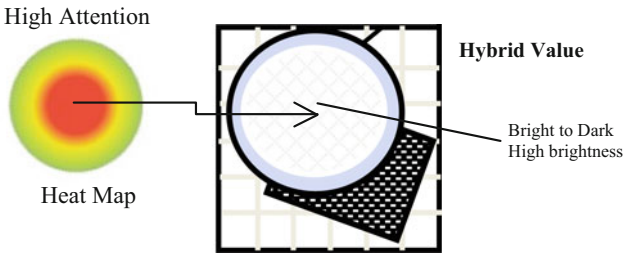

Fig. 67.7 Hybrid value illusion

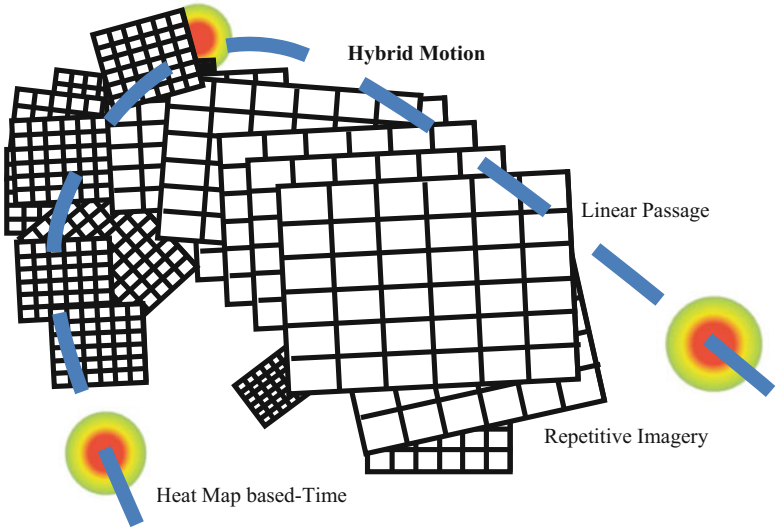

Fig. 67.8 Hybrid motion illusion

Illusion of Hybrid Motion Feature

One of the motion illusion ways is repetitive imagery. It depends on repeating the static frames within a passage of line in a series of different positions which are, namely, the movements [21, 22, 24]. Heat map dynamic visualization based on time stamp duration will be used to record the movement of gaze in each frame (Fig. 67.8).

Hybrid Shape: HFOVA

After defining the five properties of the hybrid features visually, the researcher will build the structure of HFOVA, drawing and installing artworks based on the combined features as shown in Fig. 67.9.

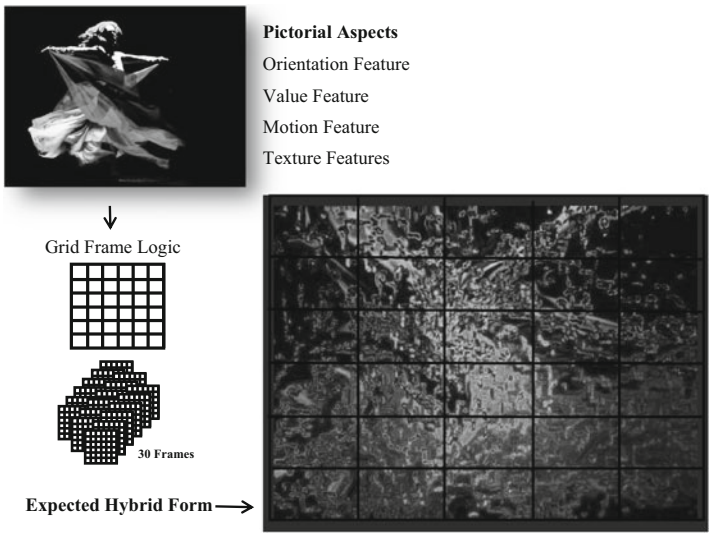

Fig. 67.9 Expected hybrid form of visuospatial attention

67.5 Verification

Concerning to TET server, the paper by [26] reported that the way of generating flags gaze position-based TET server is invalid; the reliability assumption through whether the eyes are successful in gaze position clarification was conflicted in their results. This report showed the valid clarification of gaze position for only one eye which should be regarded invalid for either eye. However, the recent response reported by [27] approved that Tobii T60 performance across most eye conditions was stable, with average values ranging between 0.4 and 0.7 degrees.

To ensure the internal validity of the study, the researcher will employ the following strategies [28]:

1. Triangulation of data collection and analysis-multiple sources include literature review, attention hardware and software analysis, and art-practice observation.
2. Use rich-thick description of finding.
3. Peer examination—two doctors in a computer information technology department and art program-culture center, University of Malaya, will serve as peer examiners.
4. An external auditor—two doctors in neuroscience and visual art departments will serve as external examiners.
5. Research bias clarification—the researcher biasness will be articulated under the subtitle, the research role.
6. For the research reliability, three techniques will be employed. First, the details of research scope, focus, interest, researcher role, instrument technical validation,

and visual context from which methods and data generated will be provided. Second, multiple methods of data collection and analysis will be used to strengthen reliability and internal validity. Finally, results and data analysis will be reported statically and visually in order to provide accuracy.

67.6 Conceptual Framework

The conceptual framework in this study depends on the combination between three theoretical frameworks, spotlight attention theory by William James, aspect-recognition theory of depiction by Lopes, and the number logic of linear style. Spotlight attention theory will be used to explain the attention spotlight focus, fringe, and margin. Aspect-recognition theory of depiction will be the guideline of the researcher for the depiction process, pictorial reference, information-based identification, constraints on thought, pictorial aspects, pictorial systems, pictorial recognition, pictorial meaning, and pictorial experience. Finally, linear style will be the illusion technique for shaping HFOVA.

67.7 Statement of Significance

This study could be a new creation source for an innovation that provides an alternative rational hybrid approach of depiction which redefines invisibility and visualization. Thus, the study will carry benefits to the following:

- Visual artist and design
- Vision neuroscience, eye tracking, and psychology researchers

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Chapter 68
Design as an Innovative Solution to Promote Impulsive Blood Donation Activity

Khairul Hazuwan Kamarudin, Natrina M.P. Toyong, and Anuar Sirat

Abstract The research looks into innovative design solution using a case study of Pusat Darah Negara (PDN). PDN is an advocate of innovation, evident in the previous design projects that they have conducted in design workshops which resulted in a collection of innovative design-driven solutions aimed at improving their systems and processes. Amongst the design found in their archive are design concepts for system improvements which intend to increase the numbers of on-the-spot blood donation decisions pertinent to PDN's mobile set-up environment. In a design process, selection of criteria is very important in deciding which concepts to push towards further development for production. Therefore, the result of observations and interviews is hoped to identify the specific attribute for concept selection with innovation that can meet this need to increase impulsive blood donation activities. Using these identified attributes, an analysis will then be conducted using a structured product screening and selection method known as the Pugh Concept Selection.

Keywords Blood donation • Innovation design • Design method

68.1 Introduction

This is a conceptual paper for a study in indentifying attributes for concept screening in a design process. The research will look at Pusat Darah Negara (PDN) as case studies to understand the aspect of innovation that will best promote on-the-spot or impulsive blood donation decisions. In the year 2012, answering the call for 2013 as a year of innovation by the government of Malaysia [1], PDN started to hold design workshops with design institutions to produce innovative concept for products that will help improve overall processes involving their mobile blood donation unit. The result of these year-long workshops is an archive of 24 design concepts that range from solution on physical product improvements to non-tangible products that

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touch on emotional or cultural human factors. Moving forward, PDN will need to decide which of these 24 concepts they will push to develop to be implemented into their system and processes.

The big budget injected into innovation activities by the government is a testament of the emphasis in innovation that was called for in the year 2013 [2]. However, this is where the problem lies. Conceptions of innovative design ideas do not necessarily result in the solution to the problem at hand: low willingness by the general public to participate in impulsive blood donation activities. This is the area where the design concept selection method is employed. To enable this, innovation attribute specific to the problem will need to be outlined through literature search and later cross analysed with targeted observation and focus group feedback.

68.2 Background of Research

Blood supply shortage has been reported frequently, resulting in a bad impression towards some area of Malaysia's health agencies. Amongst the excuses that are often cited by the public as a defence for not taking part in donating blood is the classic fear on needles, not being in good health or currently under medication [3]. Research officer of Pantai Hospital Kuala Lumpur, Yen said that even though blood donation programme is held often to sustain their blood supply, it does not garner the desired response from the public. Only 30 % of people that walk in the mobile blood donation set-up in public areas will donate their blood, differing from the 70 % when held within a hospital compound [4].

Medical official of National Blood Bank, Dr. Shanmuga said currently that only as low as 3 % of Malaysians have donated blood in the past 2 years, which is far from the National Blood Donation's expected target of 10 % [5]. Although the percentage has increased from 2007 to 2008, attributed to awareness campaigns, the need for blood has also risen. As a means to overcome this shortage, PDN is also forced to increase the numbers of organized mobile blood collecting units putting hopes on the quantity of events as opposed to the quality per event. One specific criterion that is thoroughly observed by PDN to increase the likelihood of a good collection is to choose locations with high foot traffic, mostly in public shopping areas and governmental as well as private institutions.

In an analogous campaign in Shanghai, China Daily reporter reported that an in-taxi screen-based campaign aimed at Shanghai and Beijing occupants has produced an overwhelmingly positive result after having completed its first year. The campaign was responsible in shifting approximately 80 % of viewers to change their minds regarding blood donation. As a result, nearly half of taxi passengers have registered to donate blood in Beijing and Shanghai using taxi screens [6]. This goes to show that even campaigns will be able to produce good results when innovative solutions are embedded into it. This goes to show that there should not be a deterrent on continuous organization of current campaign by PDN; instead, it should be complemented by innovative solutions on the delivery of the message to the general public (Fig. 68.1).

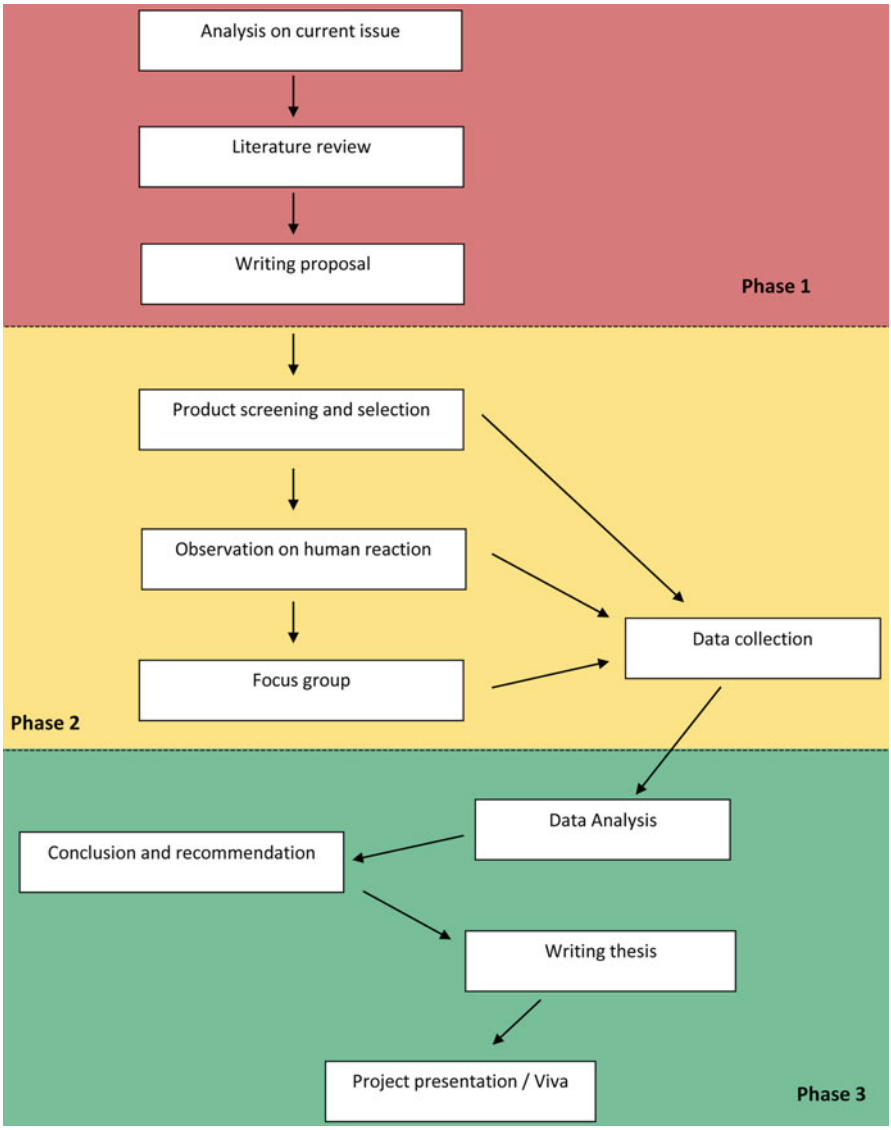

Fig. 68.1 Research flow diagram

68.3 Method

Literature search looks critically on the current system and innovative solutions relating to blood donation from other regions. The aim is to collect general themes of innovation data to compare it to the cultural and cognitive perception of their intended audience. Some general attributes of human reaction towards the act of

donating blood will be acquired at this stage. At the same time, a more focused understanding on the PDN's own target donor is established. In this case, the research looks into the 3-year PDN scheduled site set-up locations to determine its existing set-up tendency. The analysis will suggest target audience which can be acquired through demographic data of the public space or institutions involved.

The second phase of the research will focus further on site observation of human reaction at blood donation set-ups followed by in situ interview. The observation will focus on the participants as well as the general public around the blood donation site. The result of the observation and the on-the-spot interview will provide additional list of attributes that can be tabulated against the initial list acquired through literature and document analysis.

Following that, using the refined list of attributes, the 24 concepts will be narrowed down to five using a concept screening method by Stuart Pugh developed in 1980 [7]. The attributes acquired through literature search as well as the analysis on the supporting documents of 24 archived concepts will assist in identifying innovative solutions that will best achieve the intended goal of eliminating negative perceptions driving low on-the-spot blood donation participants.

To further identify the concept which will be pushed into product, a focus group study will be conducted. The participant criteria will be based on the target audience that was identified during the first phase of the study. The focus group will mainly be conducted as a user testing exercise, to narrow down concepts as well as provide suggestions for further improvement and development. In a study on the role of focus group, Robert K. Merton as the first user of focus group had used it to explore motivations, rewards and intimidation factors of participants [8]. Therefore, the proposed focus group sessions will also allow for facilitated tasks to discover the perception, opinions, beliefs and attitudes of participants towards the products at hand.

68.4 Discussion

Design

Design is an ambiguous term. Design generally refers to some object or other entity. As a verb, it usually refers to a process or a series of activities. The domain of design is claimed by many disciplines from art to architecture and engineering. Each discipline may be fundamentally different in what they produce. There are arguably very interesting similarities amongst the different approaches they take, as well as subtle but important differences.

Designers use design thinking to solve problems. The aim of design thinking is to foster innovation by generating concepts for new products, services or digital applications and to develop solutions. Brown defines design thinking as a discipline that uses the designer's sensibility and methods to match people's needs with technology [9].

Design Process

To generate a new idea for solving the problems, there should be a design process. For certain problems which require user's feedback and reaction, their involvement is vital in research. The user should be involved in all stages of the design process, in order to give feedback on and guidance for design decisions [10]. Furthermore, the likelihood that the outcomes of the design process fit people's expectations and thus have less chance to fail is increasing. This includes the early process, where the designer would like to find out whether a certain idea will be valuable to people. Without user involvement, the researcher would not know what their needs and what can attract them. According to user-centred design (UCD) philosophy, users should be involved as much as possible in the different stages of the design process, to optimize the likelihood that design proposals will be appreciated by the users.

Innovation

Innovation is a condition or an activity where people create value by implementing new ideas on solving problems. Innovation is defined as something unusual or statically infrequent, notable, valuable and of high quality. Creative thinking embraces cognitive processes related to innovative problem-solving. It can lead to the generation of remarkable and helpful solutions. Creativity is a key element in design problem-solving. In getting solution for the problems, creativity is required to have innovation [9].

A major reason that design is a complex and ill-structured activity is that problems cannot be solved through the application of algorithms and operators. In another description [11], the need for qualitative knowledge and experience and the exploration of unfamiliar and unconventional design solutions require creative skills. Creativity enables the talented designer to transcend conventional knowledge domain to investigate new ideas and concepts which may lead to innovative solutions. Design creativity has been investigated in relation to the design process and design solution and reflects the personality of the designer.

Human Factors

In the previous research, the design method can solve the problem with the use of a medical product. Human factors and ergonomics, for example, can help study what people want and also their attributes. This is a method that possesses interaction between human and product [12]. Human factors will help identify what people need to make or do to use the product in the right way. Human factors in design can give benefit to the user by improving safety, minimizing errors, reducing training time and increasing efficiency. Innovative medical technologies help ensure improved patient care and cost-effectiveness.

Satisfaction

The relationship between customer satisfaction and customer loyalty is evident in many service industries and should transfer to non-profit relationships [13]. Satisfied volunteers are more likely to remain with the organization longer, donate more and recommend the volunteer experience to others. Mechanism holds amongst blood donors' satisfaction, and their loyalty is even stronger than the path from altruistic values to donor loyalty. Satisfaction is the element to remain the donor loyal and to get more donors in the future. In a donor context, loyalty means that a donor is willing to give again, donate more or recommend the non-profit organization to family and friends. In the designing process, satisfaction of users should be included as one of the end results [14].

68.5 Culture

Culture can play a role on the percentage of people taking part in blood donation. According to Geert Hofstede in 1984, in his own definition, culture is the collective programming of mind which distinguished the member of one group or society from those of another. Culture consists of the pattern of thinking that parents transfer to their children, teachers to their students, friends to their friends, leaders to their followers and followers to their leaders. Usually, people will always do the wrong thing from our view, but in their understanding, it is the right way because they always hear around them that it is the right thing to do so they keep doing it [15].

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Chapter 69
Visual Art Approach to Promoting Malaysia's Art and Cultural Heritage Overseas

Ruzaika Omar Basaree, Rafeah Legino, and Mohd Yusof Ahmad

Abstract This paper examines how visual art appreciation can be used as one of the constructive guidelines to help Malaysian officials promote Malaysian art and heritage abroad. Its aim is also to explore the potential of developing a national monitoring and art appreciation policy to serve the same purpose. A detailed investigation of existing national guidelines covering art and cultural activities such as the National Cultural Policy, National Heritage Act and National Art Gallery Act will be conducted to identify their current weaknesses. The investigation will begin with a textual analysis followed by an in-depth study of these guidelines to develop a training model that can fit the new artistic and formalistic approach. The training programme would comprise the brief study of art history, the various styles, origins, context, media and methods used in the creative processes to enrich the understanding of Malaysian art and cultural heritage. The training will enhance the competency of Malaysian officials to interpret works of art, recognize what is valuable and draw meaning from them through reflection and discussion with others as a way of making connections with the outside world. An expected outcome of this study will be the formulation and adoption of a more robust policy of Malaysia's imagery, through a national visual art appreciation policy that can be used by all Malaysian agencies involved in promoting Malaysian cultural and art heritage abroad. The policy as it is hoped will also contribute towards the development of greater understanding and expertise in art and cultural appreciation among members of the public in the interest of protecting and preserving Malaysia's rich arts and cultural heritage nationally.

Keywords Visual art • Malaysian art • Cultural heritage

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69.1 Introduction

The word art "is derived from the Latin *ars*, meaning skill" [1]. Visual arts can be defined from various fields, such as ceramics, drawing, painting, sculpture, printmaking, design, crafts, photography, video, filmmaking and architecture. The definition of visual art is also allied to other artistic disciplines, like in performing arts, conceptual art and textile arts and even integrated with applied arts, such as industrial design, graphic design, interior design and decorative art. Its usage is to express feelings and convey ideas visually on how the arts reflect and influence cultures. As the Italian critic and educator, Praz [2], noted "…the distinctions among the arts are distinctions among the sensorial directions of aesthetic expression (sight, speech, and hearing), the visual arts crystallize a state of mind at its farthest point, where it borders on the images of things".

The objective of this research is to develop a national monitoring and appreciation policy on Malaysian art for all Malaysian agencies in order to highlight and promote Malaysia's rich cultural and art heritage abroad. To achieve this objective, a detailed investigation of all existing cultural/art policies such as the National Cultural Policy, National Heritage Act and National Art Gallery Act will be conducted to identify their current weaknesses. The newly developed formalistic art appreciation model will be tested to ascertain whether it can rectify these problems. The aim of art, culture and the national agenda is to explore a roster of cultural issues that affect the nation's well-being – issues that should be on the horizon of policymakers, public and private, and at national, state and local levels [3].

The investigation will begin with textual analysis of existing polices involving the formulation of a new training model that can fit the new formalistic approach. The new training programmes would include a brief study of art history and in-depth studies of the elements, media and methods used in creative processes. The programme would also include practical exercises to enhance participants' awareness of the importance of the arts and Malaysia's rich multi-ethnic, multireligious and multicultural heritage and the need to enhance the appreciation and demands for these cultural assets among target audiences abroad. Furthermore, the study focuses on the fine arts approach that highlights the language of art in expressing ideas, experiences and feelings as the process of creating the artwork. It explores strategies, tasks and approaches on how to study the contexts of Malaysian sociocultural aspects of heritage that rely on historical, educational and artistic notions held by professionals and scholars. Visual art appreciation is one of the crucial aspects in determining the quality of the artwork. It could be delivered using several approaches, and one of them is an art appreciation approach introduced by Barrett [4] that enables people without artistic background to also evaluate the features of artworks. The approach thus offers the possibility of further investigation or exploration of a constructive visual art policy that could be applied across all backgrounds.

69.2 The Visual Arts in Malaysia

Malaysia's cultural heritage comprises of objects that Malaysians produce and collect, which form a significant aspect of the Malaysian identity. These objects, also known as Malaysia's cultural property, can be historical, artistic and technological. They provide artists and people from other countries with the means of visualizing Malaysia. The exchange of cultural resources between and among countries can thus enhance the appreciation of cultural diversity internationally.

In Malaysia, the primary role of the Malaysian Ministry of Culture, Arts and Heritage is to (i) formulate policies and legislation relating to culture, arts and heritage; (ii) plan, implement and coordinate activities relating to culture, arts and heritage; (iii) preserve and restore national heritage, either tangible or intangible; (iv) provide the infrastructure for culture, arts and heritage activities; (v) conduct research and development in culture, arts and heritage; (vi) document and publish studies and reference materials in culture, arts and heritage; (vi) develop human resources in culture, arts and heritage; and (vii) establish an international network of cooperation in culture, arts and heritage (Ministry of Culture, Arts and Heritage, 27 March 2004) [5].

Malaysia's culture and heritage are important foundations of the country's nation building process. They form the key ingredients in helping to promote social stability and economic growth. The role of the arts and culture in generating innovative and creative values for the pursuit of the objective is recognized by the government. The government therefore has encouraged all parties to engage in promoting these values among the members of the public and private sectors. The National Heritage Act (2005) stated that the objective of the Act is "to provide for the conservation of National Heritage, natural heritage, tangible and intangible cultural heritage, underwater cultural heritage, treasure trove and for the related matters" (p. 11).

Public perception on the issues of arts, culture and heritage in Malaysia is low. This is in part due to the government's constant stress on the importance of science to drive the country's development agenda. This is the reason why professional options in science, engineering, medicine and technology are given more emphasis in the country's education system compared to the arts and humanities. This research will document the necessary process in identifying the main obstacles that impede the further growth of the arts, culture and heritage sectors in the country while at the same time propose appropriate means to overcome the problem. In order to counter public perceptions about the sad scenario of the art situations, the followings measures are proposed to promote the importance of arts, culture and heritage in our education; First, that talent in the arts should be nurtured from the earliest possible age with the prospect of developing their formalistic appreciation of art; second, that arts, culture and heritage should be perceived as areas of knowledge and intellectual development, which are important building blocks for nation building in creating conducive conditions for economic growth; and finally, recognize that the exposure to the appreciation of local culture, history and heritage is an asset and feature critical to the understanding of visual arts as a whole.

69.3 Interdisciplinary Approach of Visual Art Appreciation

The significant role visual arts play in fostering global understanding, such as the importance of educating Malaysian public to comprehend and appreciate the connections across aesthetic disciplines, has increasingly turned to interdisciplinary methods and global interaction to achieve the purpose. The arts appreciation courses offer a variety of projects like interactive arts that foster interdisciplinary and global learning. Interdisciplinary art is seen as a means of integrating distinct creative methodologies of contemporary art practices like visual art, dance, music, drama or theatre in the pursuit of conveying new inquiries in terms of approaches and forms of making art. It also offers a rich perspective of artistic experience and the ability to understand relations and interrelations with the world while at the same time educate the public in all cultural dimensions with technical skills in promoting an awareness of ethical, cultural and social contexts. The close connection between art and other disciplines like aesthetics, history, philosophy and social science studies, which focus on the study of past and present human behaviours and experience, will help the public perceive, understand and value the beauty of the artworks. An interdisciplinary approach to art appreciation will broaden their world of ideas, sharpen their judgements of cultural products and also enhance their analytical and critical thinking skills. Several suggestions will be offered to provide the opportunity to comprehend artworks, traditional and modern, in their formalistic, content and contextual aspects, as well as the application of techniques and materials.

69.4 Integrated Visual Arts Programmes

Malaysian officials and agencies are required to take a minimum number of programmes from a variety of general arts to enable them to acquire adequate foundation and context to develop critical art appreciation skills in general and enable them to think analytically, critically and creatively. Approaches to art integration in this proposed programme will focus between learning in the theory of arts and learning in the practical fundamental skills and other disciplines related to visual arts. Some of these programmes embrace work from a theoretical, research-based or philosophical conviction that provides a way to learn and practise fundamental skills, knowledge and attitudes in the arts. Others constitute a practical and beneficial way of providing comprehensive instruction in the various disciplines of visual arts. The theoretical approach in visual arts appreciation and criticism will emphasize the studying of the contextual characteristics of art and its contribution to the cultural and spiritual quality of life which help transform their thoughts in understanding and interpreting art. It would take into account the context of perception and creation while focusing on the interpretation of artwork. Therefore, expertise in this acquired area will enhance their abilities to investigate and discuss art, thus strengthening their critical appreciation of artistic works.

Knowledge and skills in art such as visual elements and principles of organization cultivate and improve their aesthetic potential to participate in the creative industries of Malaysia that contribute to national economic growth and development. Having large numbers of art-tourist visitors may also help boost the country's economy and help build the national social and economic capital of Malaysia. The skills and abilities developed through this programme can be applied in their daily lives to help them describe their ideas more clearly, enhance their imagination and enable them to pay greater attention to visual details, where visual art functions as an important communication system. By developing new ways of creative thinking through art, they will come to understand one another better, as values and culture of other people are shared together. Skills in developing the process of learning will be systematically organized on existing knowledge of teaching that facilitate the visual language for the making of art. Visual and verbal languages will be used in communicating and analysing their feelings and thoughts in presenting their ideas. They are expected to display the skills of handling materials, media and techniques as well as the language of art in an effort to enrich their aesthetic and artistic experience, through cultivating positive personal and social attitudes. The ability to give critical responses to the visual artwork, based on their own experience, education, culture and personal judgement, can also help them create and execute better decision-making processes while promoting the national development agenda through artistic, cultural and creative policies. Educational transformation of visual art and culture can be achieved through political discourses, social interaction and cultural identity awareness programmes that portray Malaysia's multicultural character. Through robust national arts and cultural policy, better understanding and goodwill between states in the international community can also be promoted, to highlight visible evidences of Malaysia's rich arts and cultural heritage. At the same time, awareness of Malaysia's unique cultural heritage could be integrated into Malaysia's overseas development assistance programmes (MTCP) to promote networking with counterpart agencies abroad in the interest of international goodwill and understanding between states in the international community through cultural diplomacy.

Formal knowledge in visual arts consists of the visual language that is involved in defining art forms, media, materials and techniques. This method takes into consideration the study of signs, symbols, images and knowledge of art history, from a wide range of contexts such as the local, Asian, and Western art scenes and also arts in traditional, modern and contemporary eras. The programme is divided into two categories, namely, one, art appreciation theory and, second, the practical art making skills. Details of the structure and content of the new proposed programme are presented in Table 69.1 [6].

Details of the structure, conceptual framework and content of the visual arts in Tables 69.1 and 69.2 are referred to as Visual Arts Stage 6, Support Document by Board of Studies, New South Wales and Australia (Table 69.3).

Table 69.1 The new structure and content of the framework learning programme

Programmes	Contents of programmes
Art appreciation theory	Various theories of art criticism and art history as models to study different examples of visual art appreciation. Different interpretations of art practice are offered, particularly in the sequences, procedures, choices and decisions made by the artists and the point of view represented in their practice
Practical art making skills	Focus on producing a variety of artworks for solving problems, expressing moods and feelings and presenting ideas. Officers are expected to display the skills of handling media and materials and also to enrich their aesthetic and artistic experience by cultivating positive individual attitudes and social values through acquisition of experience and skills, in the visual art learning

Table 69.2 The conceptual framework of different content levels of learning

	Artists	Artworks	Influence the world	Audiences/viewers
Personal	Talented, intellectually or emotionally inclined individuals whose intentions are shaped by their creative imagination	Accounts of emotional expressions and statements of personal memories and experiences	The significance of ideas, experience, imagination, fantasy and the intuitive	Those who interpret the meaning and value of art in relation to personal associations
Social and cultural	Social mediators who are influenced by the social, economic and political conditions and at the same time contribute to their development	Forms of cultural treasure that reflect social and cultural interests. Artworks can be commissioned, purchased collected and preserved	Shared and inspired community interests and issues on how its representations of social meaning represent the world	Critics, historians and the public such as the consumers, patrons, sponsor and collector, whose value of art lies in its social interpretation, significance and meaning of the world that relate to the artworks
Formalistic and contextual	Those who recognize and make full use of formalist visual language and advocate ideas as a system of signs and symbols that communicate meaning	Representations of art objects that operate within the conventions of a visual language, material forms, motifs representing ideas that communicate meaning	Signs, symbols and images from a commonly understood visual language that influence and affect the world	Visually literate would read art as signs and symbols, while its meaning is implied within a formal structure of visual language

Table 69.3 Is based on the research carried out from "Arts Education Key Learning Area", Visual Arts Curriculum and Assessment Guide. It is jointly prepared by the Curriculum Development Council and the Hong Kong Examinations and Assessment Authority (2007), p. 18

Visual art appreciation and criticism in context	Visual art making
Students should be able to	Students should be able to
Express their initial impressions of visual phenomena and artwork/art phenomena with suitable vocabulary	Develop themes of personal feelings or ideas and social-related issues or identify problems through the use of observation, experience, imagination, technology and other skills
Describe visual phenomena, artwork/art phenomena and the connections among visual elements, images and focuses	Transform experiences and knowledge constructed from art appreciation and criticism – including analysis, interpretation and selection of signs and symbols – into art making/problem-solving practice
Perform formal analysis and express personal feelings and ideas on the aesthetics, style and symbolic meanings of the objects of appreciation and criticism, based on their visual elements and organization	Select appropriate visual language, media, tools and skills in accordance with the communication of a theme/solving a particular problem
Discern the style and implications of art creations of different cultures, regions, times and artists	Demonstrate basic competence in manipulating selected visual language, materials, media, tools and techniques
Interpret artwork/art phenomena in various contexts with appropriate use of knowledge of social, cultural, historical and other aspects	Select and manipulate appropriate techniques, perspectives, imageries and art forms for a unique and creative communication of a theme/problem solving; compare and contrast the artistic quality of their own and others' artwork using appropriate art vocabulary, concepts and theories with an open mind in the process of student-teacher interaction
Produce informed judgements on the appropriateness of the selection of form in accordance with the message/function and the significance or values of a particular piece of artwork in the context of appreciation and creation	Modify their own art creations accordingly; show concern for the living environment and the historical context
Perform art appreciation and criticism verbally and in dialogue and in writing	Integrate and apply perspectives and experiences constructed from the learning of the arts and other subjects
Supplement or modify the discourse of art appreciation with the integration of description, analysis, interpretation and judgement in the process of student-teacher interaction	

69.5 Conclusion

According to Kamhi [7]:

> Though the values embodied in art should transcend politics, economics, and social status… understanding and appreciation of authentic works of art can be enhanced by informed discussion of its features, its cultural context, the life and goals of the artist, and so on. What I'm arguing against is explanations purporting to justify work that is utterly incomprehensible on its own terms.

Our study shows that the experience of art is a reflective sense of our life, which is based on mental and emotional foundation. It emerges from the deep psychological need to extend our ideas and feelings of the world into a sensory form, which in turn contributes significantly to our ultimate well-being. This paper posits the argument that visual art is an essential component of our daily life and that education is not complete without knowledge of its history, purpose, function and techniques and that aesthetics and creativity are just as important as technical knowledge in the new economy.

Since Malaysia's diverse culture is a unique source of its spiritual and intellectual wealth, it should be protected, enhanced and promoted as an essential aspect of our cultural heritage at the national and international levels. Our main purpose is not only to study but also to preserve and restore the quality of the artefacts of our country [8]. The establishment of promoting Malaysia's art and cultural heritage through the visual art approach requires collaborative efforts among the different types of cultural institutions in Malaysia. Given Malaysia's active global diplomatic involvements in an era of increased globalization and interdependence, sharing with the world Malaysia's unique cultural and arts heritage would not only further promote Malaysia's development objectives but also foster greater goodwill and understanding among nations in the interest of global peace and stability.

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Chapter 70
A Framework of Empirical Study Through Design Practice for Industrial Ceramic Sanitary Ware Design

Rusmadiah Anwar, Shahriman Zainal Abidin, and Oskar Hasdinor Hassan

Abstract Conventional industrial ceramic design investigation faced numerous dilemmas especially on the design methodology. The unclear design approach practised among the designers comes to the technical hitches to introduce a new product design. A previous study on design practice shows the possibilities to overcome these problems. Understanding of Research Triangle shows a concrete design practice was still under-discovered among researchers. This opportunity comes to the inspiration of assembling ceramic sanitary ware design (CSWD) framework in conjunction to problem-solution product development. The proposed method was divided into three stages: (1) understanding the role of designer and formgiving in product development, (2) identifying the design problem and the gap, (3) setting up verbal protocol analysis (VPA) and (4) capturing and sketching profile in CSWD. The amateur-advance-expert designer will be brought to the artificial design environment to record all design activities. The outcome of this framework will benefit the designer especially in the ceramic industry in order to come out with a new product segment.

Keywords Ceramic sanitary ware design • Design practice • Formgiving • Verbal protocol analysis

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70.1 Introduction

A ceramic sanitary ware designer in the industry is practising a same research exercise while introducing a new product design. Traditionally, it consists of the system-level design phase which is created based on the in-house operation standard. The existing design method indefinite the design practices in ceramic industrial field where most of the designer struggled to identify which part of the design phase should be overcome in advance to another phase. As practised, most researchers try to overcome the importance of increasing material strength before the ceramic design can set off for an intricate design [1]. Conversely, it says the opposite of findings which has been exposed especially on developing an art or design in a research or design practice. Over the years, Frayling clearly categorizes these issues with 'research into art and design, research through art and design and research for art and design' [2]. Of these, the most contestable from the outset is 'for' which Frayling himself commented on as 'research embodied in the artefact' [3]. Thus, by identifying the focus of the design, research should be able to clarify the different degrees of design development.

A rational CSWD not only affects the production performance but also presents a limitation on the design development. Most of primary designs concern usually on the improvement of the technical or material itself. No consideration was discussed towards matching the abilities of the materials with design structure requirements. Therefore, numerous ceramic products are poorly designed, resulting in unnecessary imperfection, ugly shapes and repetition of form style. In a sense, a new design framework should be introduced in order to provide another view of design practice for CSWD. In the following, we will present the background of design theory existed and case examples of design interpretations based on the 'formgiving' by Abidin [4] and structure a new design strategy by morphing a 'new segment to sanitary ware product' in the route of exploration through design practice. Finally, we will suggest a new design framework especially in research practice for CSWD. The objective of this study is to present an approach to develop a product through design practice.

70.2 Review on the Principle of Design Research and Design Theory

The design principle required the selection of balance, rhythm, contrast or repetition, while the element of art includes line, shape, colour, hue or tone. However, Jonathan explained in his report that any other activities associated with design, such as coming up with a working concept, were considered art and not science [5]. In order to construct a new CSWD framework, the boost of research idea will only be defined by designer-centred approach [6]. Abidin has concluded about the importance of a designer's contribution in examining the element of form development based on their own skills and knowledge [4]. In this case, they have detailed up about any research or design studies especially in the design field involving observation. If the purpose

of the research is to improve the understanding of an individual, a relationship and a particular society or culture, then that knowledge begins with observation.

On the other theory, Abidin is also resolute about the need for a research approach where the 'old master' plays an important element in form development [6]. As a first stage, observation became a groundwork study and underpins the significance of these approaches to design research. However, there are also a variety of observational techniques to consider, and these vary according to age, conceptual abilities, relationship with the observer and of course the purpose of the research [7]. In order to formulate an engineering design in form development, they always count on the principle of solution [6]. For these reasons, CSWD required a new formula in order to avoid the 'eureka moment' [8] which comes in like a flash. In another perspective, aesthetic consideration on subjective manner, emotion and qualitative form experience needs to organize 'wild processes' applied by ceramic designers.

Axiomatic Design

Design is an interplay between what a designer wants to achieve and how the designer achieves it. It is a creative process but must become a principle-based process. In order to establish a scientific foundation of design, Suh has created and popularized the axiomatic design theory ([9]). On his first findings, he stated only five initial design projects were considered. The design axiom theories are discussed later in his second book where he mentioned about the creation of design axiom acknowledged by identifying the common elements that are present in all good designs [10]. Axiomatic design has two design axioms formally stated as:

- Axiom 1: The independence axiom: Maintain the independence of the functional requirements.
- Axiom 2: The information axiom: Minimize the information content of the design.

Parallel to the design principle in ceramic design practice, Suh was able to prove and succeed design research model in formulating the subjective into objective manner. A kind of three major scopes in ceramic field should bring these advanced practices as benchmark for further improvements.

Interaction Design Research Model

Another sample of design research model has been established based on Frayling's theory, who came up with a conclusion about the three main indicators to merge a design and research. Figure 70.1 shows how Fallman clarifies the similarity by dividing the model into three different modes of design practices [11].

Based on Fig. 70.1, Fallman also has identified a design research practised by six PhD candidates mentioned by Frayling, and it shows that three candidates came out with a method by studying all design research segments. Two of them were directed

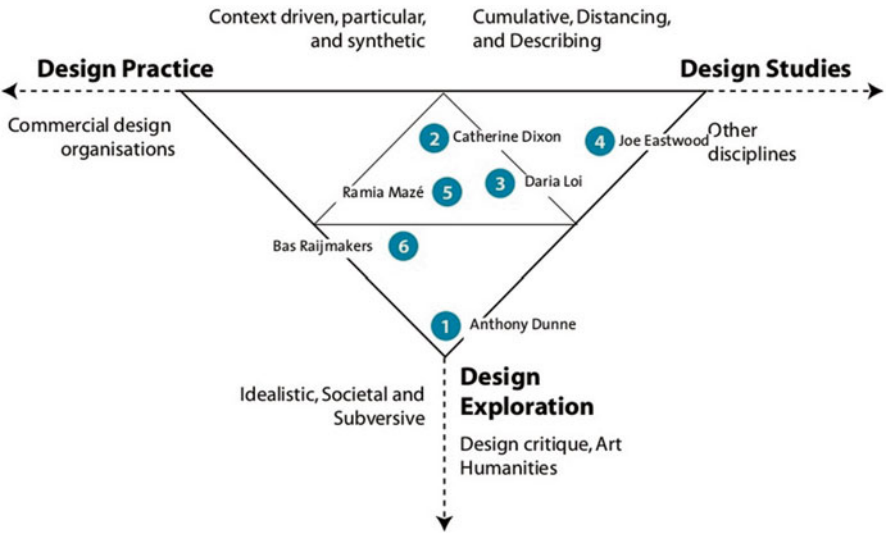

Fig. 70.1 Fallman's design research triangle [10]

Table 70.1 Art and design research defined by Fallman[a]

	Design research model		
Research	Design practice	Design exploration	Design studies
Terms	Through design	Into design	For design
Discipline	Commercialization design organization	Design critique, art, humanities	Other philosophy disciplines
Types	Context driven, particular and synthetic	Idealistic, societal and subversive	Cumulative, distancing and describing
Suitable analysis	Practised	History	Industry

[a]Sample derived from Fallman's theory

into design exploration and only one swung into design studies. In this case, none of the candidates align to investigate the design practice approach. In sequence, it offers a lot of space or gap to look into CSWD through design practice. In order to find differences between this design research triangle model, Fallman described the comparison of research significance as divided in Table 70.1.

Role of Formgiving in Product Development

Formgiving became a new term in Southeast Asian context where hard-to-find researchers from this region discuss on related issues. Ironically, this popular term among design practice authors was also not mentioned in any English dictionary.

The phenomenon was started by Abidin when he explained about formgiving which has been used by the Scandinavian countries for almost 20 years, applied in a specific phase on design process. Transforming solution into a principle became a materialized design [4].

The purpose of a study on formgiving role in developing CSWD framework is to understand the physical principle of how ceramic characteristics can influence shape and form. The motive is to show that the knowledge of structural consideration can have a potential to understand the construction of the design. It begins from a technical perspective and finds a way to understand either structural stability, shape and element or force and moment. The influence of formgiving is important as a final product form. Mostly, modern cars have applied these features and offer an impact to the viewers who have engaged the product with elegance and efficiency including a good function performance. The subject matter character was mapped from an animal to be transformed into a car [4].

The discussion thus far has focused only on the structural aspects of new sanitary ware design. There are also important technical issues that are nonstructural in character. It is useful to review some of these issues as a way of understanding how they differ from structural issues. In these studies, the positive benefit of ceramic design is explained explicitly and implicitly. It can accrue through attempts to improve the technical performance in any scale. A rational ceramic design affects not only the production but also limitation which existed on the design. But in the most of ceramic design, the primary concern has usually been the improvement of the design or material itself. No consideration was discussed towards matching the abilities of the materials with the ceramic structure design requirements. Consequently, many ceramic products are poorly designed and result in unnecessary imperfection. Formgiving merges with concerns about functionality and construction [12].

70.3 Proportion of a Method for CSWD

It is normal to come across an inspiring ceramic product design. However, it is difficult to find the right or concrete design principle used when developing the ideation and development until it is successfully constructed as a final design [13–15]. In our design framework, the fundamental issues are to recognize (1) the industrial ceramic design practice and system applied for mass production; (2) how ceramic designers performed their design plan while developing products; and (3) structural patterns from 2D and 3D sketch which lead to the conceptual design including functional requirements and the aesthetic of form. The method proposed will integrate these three features as guides for CSWD development through design practice.

There are generally two routes for CSWD as shown in Fig. 70.2. At the top stage of the investigation, the study was divided into four activities of data collection. This research framework will derive both qualitative and quantitative inquiry. Data collection will be divided into two (2) to confirm the division between 2 sections:

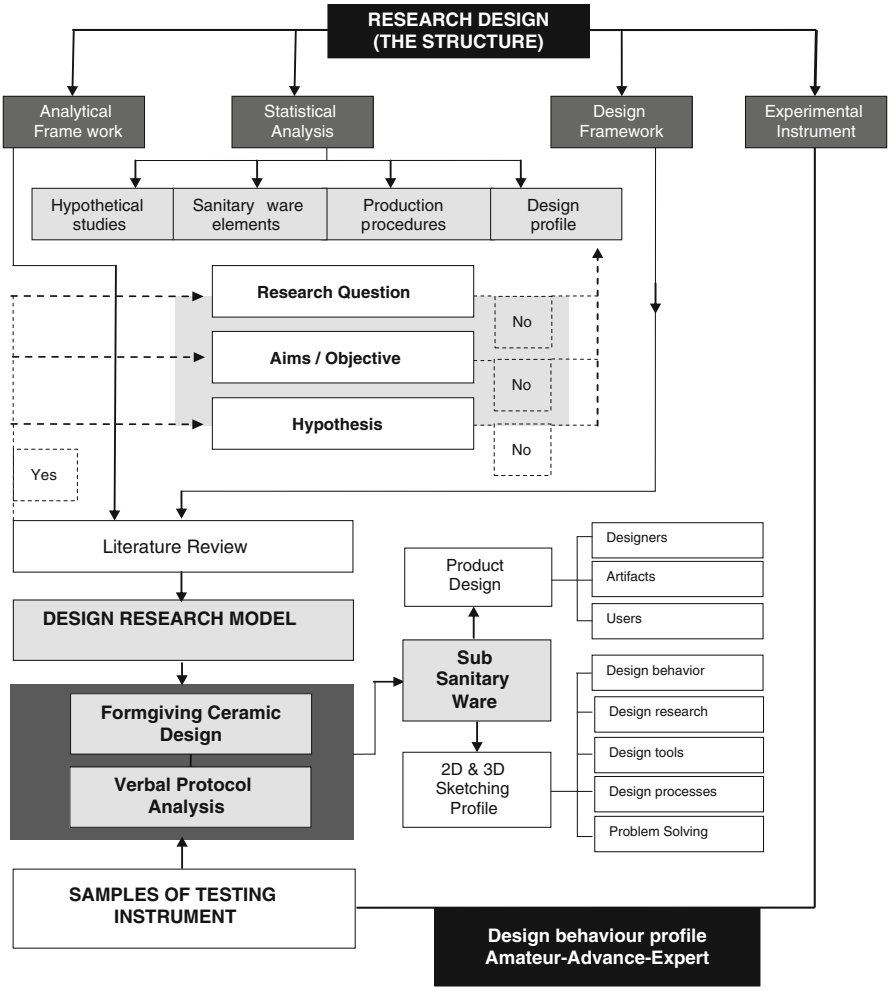

Fig. 70.2 The proposed method for CSWD

1. *Previous study*
   (a) *Analytical framework:* Review of design practice
   (b) *Statistical analysis:* Review on the related fields of ceramic industry
2. *Future study*
   (a) *Design framework:* Two main studies – observational and laboratory
   (b) *Experimental instruments:* Capturing technology and technical assessment

At the bottom stage, the investigation will go through the artificial environment to compare the study and validate the critical design situations faced within the scope. The CSWD methods intend to combine both qualitative and quantitative methods to

surmount the unstructured product development in ceramic design practices. The potential research framework will be guided with three main variants in matrix model: 'analytic (first) plus descriptive (second), descriptive (e.g. narrative) plus analytic and finally argumentative plus analytic'. The procedure is as follows:

Stage 1: Understanding the Role of the Designer and Formgiving in Product Development

Zimmerman has a different thinking about designers. His comment captures what a loaded term 'designer' is. Based on his two different groups of interviews, the participants noted that interaction designers brought a process for engaging massively under-constrained problems that were difficult for traditional engineering approaches to address. Another point of view is explained, designers brought a process of integrating ideas from art, design, science and engineering in an attempt to make aesthetically functional interfaces [16].

There will be an association among several variables; factors between material and design structure will have an effect on several measures of performance. Here, the emphasis is on developing a design structure and bringing those shapes, material and user together in line with each other. The aim is to come up with a new design framework in ceramic sanitary ware and discover how formgiving can really influence to embark with this development. The framework of new sanitary ware design in general alternately will use two modes in a sequential way, starting with an extensive use of hypothesis user's motion and designer's thinking procedure. Finally, the bridge for solution connects by each variable as merging procedure.

To measure formgiving in design related to the subject matters, Akner-Koler suggested a qualitative measurement for documenting findings. In Muller's perspective, quantitative measures are more significant [4].

Stage 2: Identifying Design Problem and the Gap

For CSWD framework, a culturally based product related to religion, where the nature of users in practice with the current design was still not practical [17, 18]. The selection of ablution as a subject matter because of the physical and needs includes the environment factors. In principle, each Muslim was entitled and responsible to look into the importance of performing ablution as a ritual. However, there is no consideration of the preparation towards the next level of the product design. The CSWD framework is designed to accomplish the design issue on problem-solution-based product to make sure that there is no benchmark design or product to be compared to. However, in this practice, how to develop a product to make possible a user perform ablution in comfort, practically with a minimum use of water, will be shown.

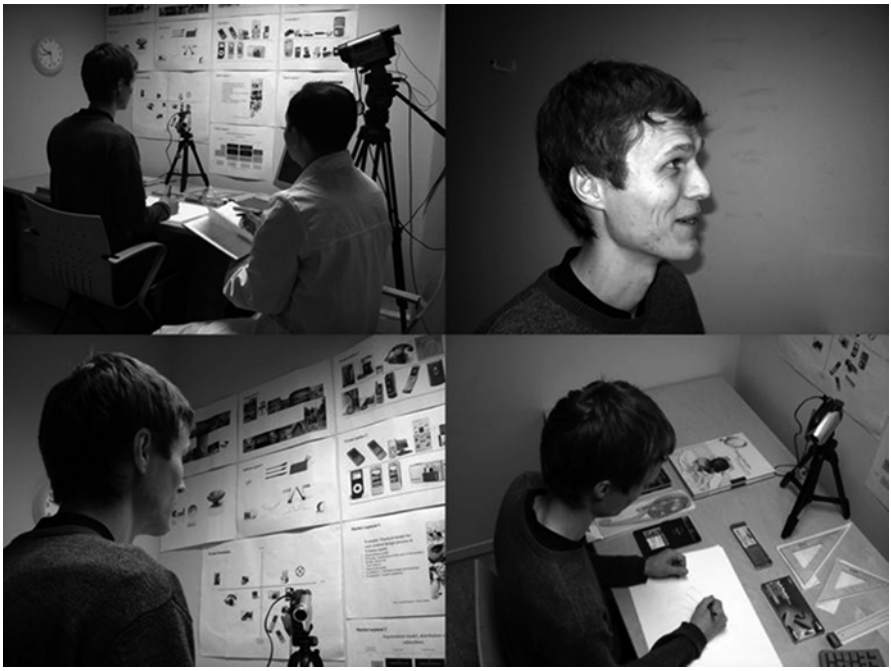

Fig. 70.3 Verbal protocol analysis experiment set-up [19]

In every ablution area as well as restroom in any building (probably Mosque) in Malaysia, the men are separated from women in a different area. However, there is no issue between users of two different needs because the ablution practice still comes with the same standard. The existing ablution area is prepared with reachable sinks, pipes and benches for the Muslims. Yet, lots of Mosques do not have the specific ablution tub design as required [17, 18]. A variety of the types of ablution platform took place, and the most typical design used was prepared only with a normal tap. With the identification of the design problem, the correlation between designers, artefacts and users in designing a new product development was recommended.

Stage 3: Setting Up Verbal Protocol Analysis (VPA)

In verbal protocol analysis (see Fig. 70.3), it has become a tradition by many researchers to analyse design activities in a qualitative way. As a part of the designer's world, most of their time is spent in design activities in order to boost up their capabilities and creativity in such wide design strategies. A lot of options had been introduced by previous researchers regarding the analysis method of design activities. A VPA could be performed in two types of design situations – natural and

artificial – as shown in Fig. 70.3. VPA involves getting people to do something to verbalize their thought. In detail, they share their feeling as they exercise whatever they practise. It has also become a navigator tool on how people describe themselves in communicating with an object. Both activities need to be recorded without separating respondents with the object as communication language [19].

The observations through the developed VPA probably look inside the designer's mindset, and for our study it cleared as:

1. *Design can be studied in different ways. A good example of how the same protocols of designers have been analysed from various – scientific and practical – perspectives was mentioned by Cross* [20]. *One of the relevant aspects in modelling the design process is decision-making. Simon already noted that decision-making and design are so entangled that the entire decision-making might be viewed as design.*
2. *In order to achieve the new sanitary ware design framework, analysis of the three protocols* [21] *leads to find an operationalization of mindset to ceramic designers. Decision nature will test on:*
   (a) *Framing decisions – which are decisions made during the period when a designer mentally frames the ceramic form*
   (b) *Key decisions – those made at moments when the (preparation of the) ceramic creation occurs*
   (c) *Enabler decisions – those that signify mental object representation instants*

Stage 4: Capturing Sketching Profile in CSWD

Sketching will become as the most influenced evidence to view the finalization and history of decision-making. Goldschmidt [22] summarizes the metaphorical thought. Sketch can give a new meaning where two types of activities could be described: 'seeing as' or another type is 'seeing that'. In this study, several types of sketching profile in developing sanitary ware will be discovered. Each process contributes with characterization results on stage. Particularly, these stages were divided into design thinking as stated below:

- Design behaviour
- Design research
- Design tools
- Design processes
- Problem solving

The key procedures in observing the sketching profile were based on Product Design from Nature (PDN) framework defined by Wen et al. [23]. They believed that the ideation process which involved a case study from nature can influence the design developments. At this stage, improved sketch observation will be determined by a sequence beginning from (1) observation from nature and (2) learning

from nature through the free-hand sketch to (3) the feature of form aesthetics. This process will undergo the communication cycle between designers, artefacts and users.

70.4 Case Study and Sampling

The intention of the case study is to construct new types or segments of industrial product basically produced by ceramic materials. The product design is inspired by the nature of the ablution ritual and practices of Muslims before performing a prayer. It is designed with ergonomic and comfort features and practically used by either men or women. The product design were valued based on the problem-solving according to their creative an innovative solution to provides easy fixing system at any space primed for installation. In conclusion, the suitable production procedure was put in practice for mass production purposes.

For over 4 months, 5 designers observed the artificial design lab and studio sets where each of the amateur-advance-expert was briefed to (1) identify CSWD for ablution tub design, (2) present sketching profile of design work on the concept and (3) conclude the development part for the designers.

We would like to know whether the ceramic designers work their experience based on cultural needs and how the sketching profile suit with designers-artefacts-user can be integrated. After the data collection is complete, each group of amateur-advance-expert will be compared to find the pattern used among the different hierarchies of ceramic designers.

70.5 Conclusions

This paper proposed a design framework as a method for ceramic sanitary ware design based on ritual studies among Muslims in Malaysia. It considered the unclear design methodology practised by ceramicists. A new approach was introduced to develop a new product segment for CSWD and clearly solved the interaction and needs between human and product, through the introduction of artificial environments and approach. The method needs to be further developed before the analysis study is implemented to suit the nature of design activities as the method relies on the natural dialogue among ceramic designers. As a rule, it is important to develop a natural place for this protocol. Without any possibility, an artificial designer's working space needs to be located as the original set-up in a laboratory.

The importance to bring the design practice into CSWD is to underlie the principle in industrial ceramic manufacturing process and technical approaches transferable to design practice. The exploration of verbal protocol analysis straightforwardly records all design activities, action, body language or decision-making. However, it still has a weakness in order to have the designer's expression on their

ritual design performance. There is also a possibility on getting a subjective result even with a structured methodology due to human intelligence. It will become a platform to identify the design thinking between amateur, advance and expert designers when resolving problem-solution-based products.

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Chapter 71
Symmetrical Motif Design in Malaysian Batik Sarong Patterns

Rafeah Legino and David Forrest

Abstract The focus of this paper is to investigate the four main characteristics of the symmetrical placement in batik sarong design. The first is translation, or the repetition, of a motif so that each time it is repeated, it is placed at an equal distance and retains the same size. The second is rotation, when a motif turns around a point, which can be a rotation of 60°, 90°, 120° or 180°. The third is reflection, when the motif is mirrored in its repetition; and the fourth is glide reflections, when motifs translate along the axis and at the same time reflect across an axis. Batik sarongs from Malaysia commonly utilize these geometric design principles. This symmetrical patterning provides balance and harmony to the sarong composition. The result of the analysis shows the enhancement of the visual impact on fabrics. The symmetrical order is examined by analysing the layout of the batik sarong's panels in the kepala kain (main central panel), the badan kain (larger left and right panel), the apit kain (the framing border) and the tepi kain (upper and lower edges). The findings show that in each layout of the batik sarong, more than one of the symmetrical processes are used.

Keywords Symmetrical placement • Patterns • Motifs • Batik sarong

71.1 Introduction

This study is an emphasis investigation of the role of symmetrical patterns that is embedded in some of the layout designs of the batik sarongs in Malaysia. Firstly, the review of related literature on symmetrical patterns and batik sarongs design was conducted. This was followed with the analysis that deals with several selected

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samples of the Malaysian batik sarongs that have been viewed and photographed from the personal collections and museums in Malaysia. Finally, the classification was categorized according to the arrangement of different repeated motifs that indicated the use of translation, rotation, reflection and glide reflection illustrated in the composition of several segments of Malaysian batik sarongs.

71.2 Batik Sarong Design in Malaysia

The term batik is easily recognized by its process, as "batik is a method of drawing or painting with wax upon a fabric, after which the material is dyed and the wax removed [1]". Nowadays, the batik techniques are practised all over the world, which has contributed significantly to the continuation of the ornate designs for clothing. The batik sarong was formed through the creation of the batik process with the specific layout design [2]. Erstwhile studies of Malay culture, which mention clothing in Malaysia, include those by McNair [3], Swettenham [4] and Winstedt [5], who analysed the uses of the batik sarong from Indonesia, which were commonly worn by Malay women and men. Later initiatives were developed by Malaysian batik craftsmen when they started producing their versions of batik sarongs. Through this observation, it is evident that some traditional aspects have remained and were influenced by various Indonesian batik sarong designs. This was supported by Sheppard as he who noted how the batik process was adopted and that "the process followed in Malaysia is not quite the same as that of Java and the designs and colours used are also different [6]". Therefore, the batik sarongs produced in Malaysia entailed some elements of tradition and change in their motifs and pattern designs [7, 8].

Batik sarongs in Malaysia continued to possess some similarities of composition to the traditional design characters. Veldhuisen [9] delivered an in-depth analysis of various batik sarong samples from Indonesia, and he supported this by drawing segments of the layout of sarongs. Linked to this examination, for example, the layout features in Malaysia "demonstrate that the Malaysian batik designs have been adapted and influenced from traditional Javanese batik sarongs [10]". The composition of batik sarongs was also similar to other sarongs. Traditional sarongs have balanced compositions, as the previous studies identified, with regard to labels in every panel with different terms but essentially similar meanings, and the layout is also similar to the configuration design that is commonly applied to the batik sarongs in Indonesia [11]. The analysis of several samples of batik sarongs that have been photographed and traced has shown that the layout is formed with four segments – the kepala kain (the central panel), the badan kain (two larger areas which are the left and right panels), the apit kain (the framing border) and the tepi kain (the border, which is located at the upper and lower edges with fringes) as updated by Legino [8]. The role of the layout in batik sarongs is to arrange all the various motifs in an appropriate arrangement in every panel.

71.3 Geometrical Concepts of Symmetry and Transformation in Batik Sarongs

The word symmetry actually originates from the Greek word "sum metria" meaning same measure. It brings to mind ideas like balance, order and harmony found in nature, art and mathematics. According to Syed and Amer [12]:

> Symmetry, like pattern is omnipresent. It is the glue that binds the Universe. It is physically, aesthetically, morally and in all kinds of other ways – some obvious, some remaining mysterious. (p. viii)

Locher and Nodine explained that "symmetry is a property of a visual stimulus which catches the eye in the earliest stages of vision. The visual system seems capable of automatically processing symmetrically-organized stimuli without scrutinizing concordant features [13]". Further, Knight [14] stated the various phenomena of patterns that develop through the representation, construction and symmetry classification. The examination included the role of repetition that constructs various patterns:

> Conventionally, a motif is defined as a continuous shape, and repeats of the motif in a pattern do not overlap one another. (p. 305)

Hann [15] debated the analytical potential of symmetry classification as a tool for cultural analysis and, by way of illustration, presents a case study, which compares data from two clearly differentiated cultures (the Miao Chinese and the Han Chinese) living in close geographical proximity. Therefore, the significance of symmetry is central to everything, as it governs the natural forces of the universe. In addition, geometrical form in the area of symmetry offers the most exciting principles in mathematics. Mathematicians define symmetry as transformations that allow an object and a pattern to stay unchanged and at the same time form a mathematical structure, which acts as the symmetry group of the object. Patterns are ornamental designs made up of repeated or combined motifs. Patterns have a geometrical basis, and no matter how complex these patterns are, they will fall into one of the symmetry groups of either the frieze patterns or the seventeen wallpaper patterns. As stated by Makovicky [16]:

> Pure unit-mesh and plane-group characterization yields only a partial picture of pattern variability. Therefore, further classification of patterns can only be achieved by studying their individual elements as well as their mutual relationships and their positions in respect to symmetry elements. (p. 957)

Symmetry is important in this study as it is related to pattern, which centres on the notion of repeated designs found in the frieze patterns that are embedded in Malaysian batik sarong design. In terms of visual organization, symmetry can be considered the preservation of configuration and form, which exists either across a point, a line or a plane. In fact, it has the ability to match a motif exactly to another motif, which can be repeated in not more than four different ways. The techniques that are used for the analysis are from four types of repetition and are called trans-

formations. Translation occurs when a repeated pattern or motif slides up or down, right or left or diagonally while still maintaining the same orientation; it will definitely fall back upon itself with all the motifs matching exactly. The second is rotation that happens when a motif turns with a repetition around a point. The angle of rotation can be 60°, 90°, 120° or 180° only. The order of a rotation is the number of times it has to be performed to bring the plane back to where it started. The third, reflections, is when a reflection fixes on one line in the plane; this is called the axis of reflection. A reflection occurs when a motif reflects and the image reverses as in a mirror. And finally, glide reflections occur when a motif translates along the axis while at the same time reflects across an axis. These four types of repetition will be used to identify the formation of symmetrical approaches in batik sarong patterns.

A number of writers have been reviewed, and a significant paradigm has been delivered by Haake [17] regarding the examination of symmetrical patterns in Javanese batik pattern designs. Interestingly, the analysis of the traditional Javanese batik patterns was significantly interrelated to the symbolic context and meaning. Further, Liu and Toussaint [18] proposed and contributed a new method of classifying and constructing the geometric textile design patterns throughout the tessellation-transformation procedure. In textile decoration, motifs are the key elements that are usually organized in a variety of positions and contribute to the balanced composition of patterns. A batik sarong motif is sometimes inspired by different sources of motifs created with floral, geometric shapes or others. Several samples were gathered in order to identify the types of symmetrical compositions that are embedded in batik sarong designs, which are produced in Malaysia.

71.4 Four Types of Repetition in Batik Sarongs

The classification from the four types of repetition is found in the following analysis as shown in Figs. 71.1, 71.2, 71.3 and 71.4.

71.5 Conclusion

To sum up, symmetry is important in this study because it is related to pattern, which centres on the notion of repeated designs that can be repeated in not more than four different ways. These are known as transformations in identifying the formation of symmetrical patterns in Malaysian batik sarongs. The techniques used for the analysis of the design motifs are translation, rotation, reflection and glide reflection.

The study establishes that the use of symmetry was widely emphasized in the design motifs of the Malaysian batik sarong. The choice of design motifs were mostly based on the natural environment, which were arranged in a particular way to reveal the beauty of its design composition. The study also shows that the appli-

Fig. 71.1 Vertical translation, diagonal translation and rotation of 180° in batik sarong design. No. *1* vertical translation; *2* diagonal translation; and *3* rotation 180° (Photo from the National Museum in Kuala Lumpur collection and drawing by Rafeah [8])

Fig. 71.2 Horizontal reflection and vertical reflection in batik sarong design. Nos. *1* and *2* vertical reflections, and *3* and *4* horizontal reflections (Photo and drawing by Rafeah [8])

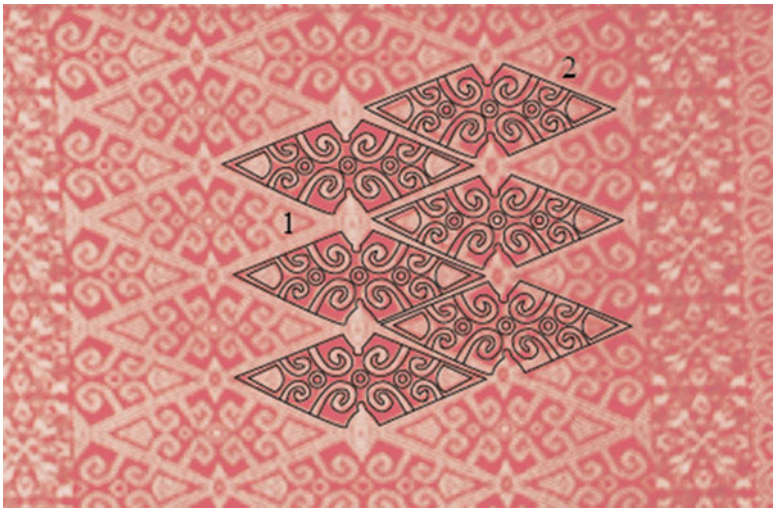

Fig. 71.3 Glide reflection in batik sarong design. Nos. *1* and *2* glide reflection (Photo and drawing by Rafeah [8])

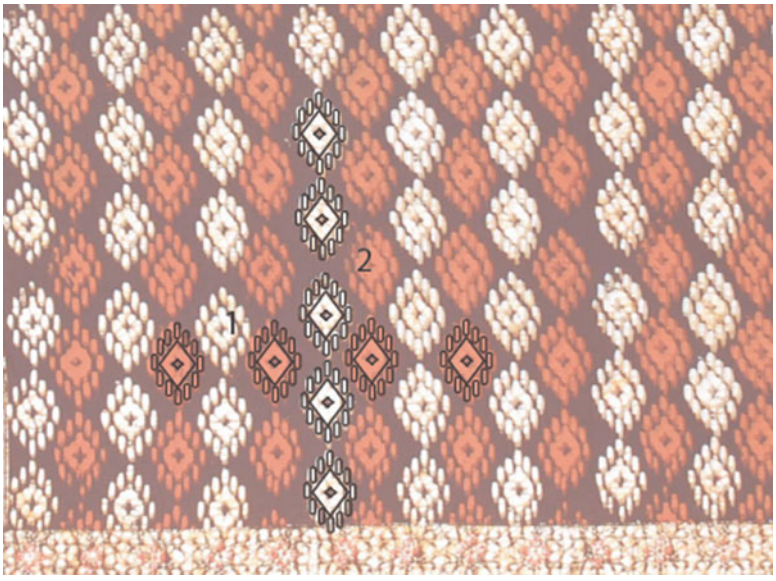

Fig. 71.4 The batik sarong illustrated the horizontal and vertical translation. No. *1* vertical translation, and *2* horizontal translation (Photo and drawing by Rafeah [8])

cation of mathematics was used in Malaysian traditional art and crafts. A catalogue that documents the momentous nature of this study will benefit art students, art enthusiasts and art institutions in providing references for future studies. Perhaps this finding will encourage and also be used as an extended collaboration with other areas of studies such as in the field of anthropology, cultural heritage and conservation practices in enhancing the significance of Asian art and tradition.

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Chapter 72
Folding Paper Technique Incorporation in Plaster Modelling

Verly Veto Vermol, Nurul Husnah Harun, Mohamad Rizal Salleh, Rusmadiah Anwar, and Oskar Hasdinor Hassan

Abstract Plaster modelling technology in ceramic industry is a crucial segment in new product development process especially in realising design on paperwork to actual planned form which consists of perfection in modelling skills. There has been plenty of discussion on the suitable industrial ceramic tools, techniques and machines in fabricating intriguing design and shaping that suits both in aesthetic and function [1–5]. This paper will be discussing the framework study of paper folding techniques' potential in industrial ceramic modelling process. The study is directly related to the investigation of paper folding incorporated to the conventional plaster modelling process that involves form development, materials, and technique development. Paper folding is mainly describing the geometrical attribution in structure and form. The aim of this research is to establish folding as a primary design tool in plaster modelling and by doing so to reintroduce it as an essential topic in design education, design practice and industrial references.

Keywords Plaster • Design • Paper folding • Plaster modelling

72.1 Introduction

Plaster modelling process and development in ceramic industry is a crucial segment in new product development process especially in realising design on paperwork to actual planned form which consist of perfection in modelling skills [1–5]. It involves all the

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technical possibilities of working on plaster forming process either manually or with the help of machine to supply quality model finish before going through mould making.

Plaster models turning on a lathe machine are primarily and widely used in manufacturing industry especially for symmetrical model, although the item can be further manipulated to the great extent after taken off from the machine (Anthony Quinn 2007, Ceramic Design Course). Plaster modelling technique is pretty much the same way as carving wood. Plaster is a relatively soft material which needs extra measure and skills to be carved, shaped and formed. It is possible to translate design shape on a plaster model using rulers, callipers and card profiles. Accuracy in plaster model works is a necessity in order to achieve surface quality, scale and geometrical design form [6–10]. There has been plenty of discussion on the suitable industrial ceramic method introduced through tools, techniques and machines in fabricating intriguing design and shaping that suits both in aesthetic and function [11–13].

Folding techniques can be generic folding concepts from which ideas for designed product can be derived; it presents practical concepts of folding that can be adapted infinitely by any designer from any design discipline, using any sheet of material (Paul Jackson 2011). During the sixth century, paper was introduced in Japan. It is here that paper folding became an art form and evolved into what we know today as origami. The name 'origami' is originated from Japanese words 'ori' which means folding and 'kami' which means paper. When combined together, it formed the word origami. Origami is an ancient Japanese art that is using folding concept to create a design. Most of the origami techniques have been passed through generations. A new design can be made from a sheet of two-dimensional papers to create various shapes of design. Origami involves creative thinking of mathematical concepts such as geometry and symmetry forms (Art and Craft of Paper book by Faith Shannon (1994)).

Illustration 1 showcases intriguing paper folding artworks of Paul Jackson where most of his artworks are presented in three-dimensional objects. Inspired through paper folding, this research paper is a framework study on the potential of paper folding technique as an alternative tool for developing plaster model which aimed to capture the complexity pattern of its beautiful folded geometrical paper pattern to be adapted as an aided aesthetic value in plaster modelling. The objective of this research is to incorporate the concept, technique and material of folding paper to the process of plaster modelling.

72.2 Methods

In this process, it is important to understand that products are designed and made to serve its specific values. As per stated in Fig. 72.1 on the next page, the early stage is by conceiving the physico-chemical form, suitable geometrical and its use to fulfil the intended functions of desired values. This is a kernel process in product designing of which to reasoning from values, via needs, functions and properties to the final form (Roozenburg and Eekels 1995).

Fig. 72.1 Paper folding artworks in three (3)-dimensional forms

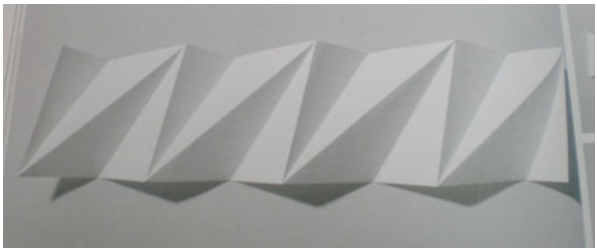

Fig. 72.2 Sample of paper folding pattern

The functioning of a product depends on its form, use and context of use. The reasoning in a design model is a generic representation of how designers reason when designing. The model design stated in Fig. 72.1 is primarily based on the design of tangible products. The model helps designers to be aware of and reflect on the different levels of reasoning. Through the folded paper, the geometrical properties such as weight, texture and strength are then studied. These particular properties describe the expected behaviour under certain circumstances.

Designing Process

Taking points of its intensive and extensive points, the process begins by creating the design based on the types of folding techniques. There are types of folding techniques applied by designers, that is, all designers crease, pleat, bend, hem, gather, knot, hinge, corrugate, drape, twist, furl, crumple, collapse, wrinkle, facet, curve or wrap two-dimensional sheets of material and, by this processes of folding, create three-dimensional objects. Like developing ideas in a sketchbook, the key for developing good designs in folded paper is to work fluently and quickly (Figs. 72.2, 72.3).

Folding is not always needed to be technically perfect (Paul Jackson, Folding Techniques for Designers: from Sheet to Form, London: Laurence King Publishers (2011)). In order to further enhance the pattern form study, sketches of ideation

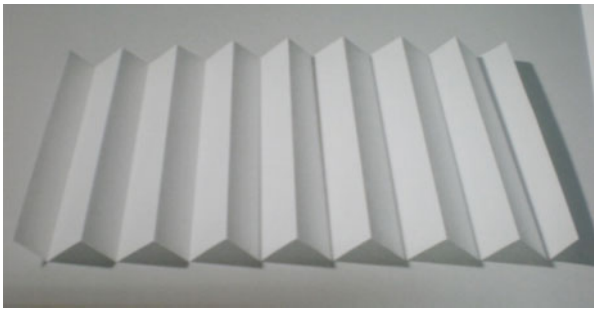

Fig. 72.3 Paper folding pattern on paper

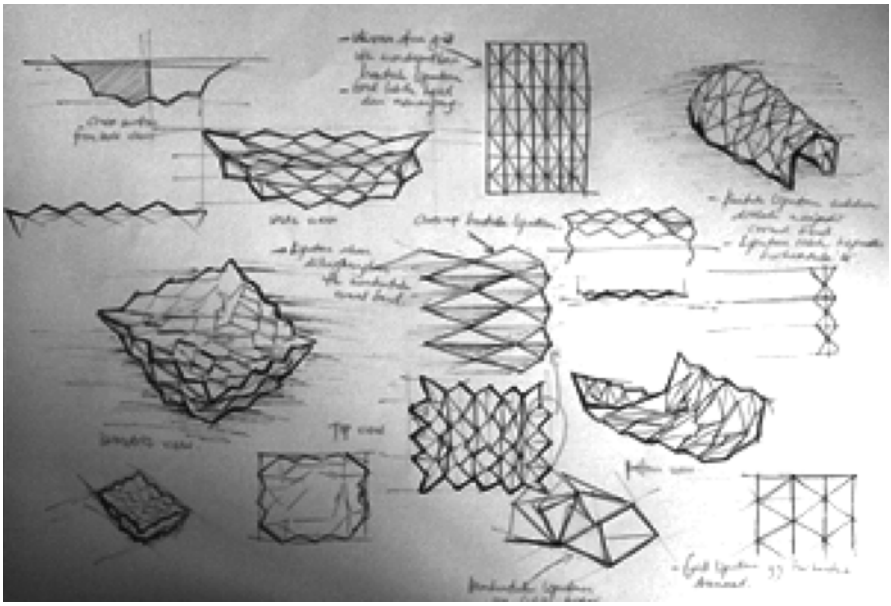

Fig. 72.4 Paperworks on design and ideation

were developed in both two-dimensional (2-D) and three-dimensional (3-D) drawings based on visualising paper folding concept as per shown on illustration 2 and illustration 3 (Fig. 72.4).

Fabricating Process

Through selections of an earlier design study, thumbnail sketches and technical drawing are then developed and drawn in detail in accordance to the real measurement. For further research, sketches were made to visualise and to express the

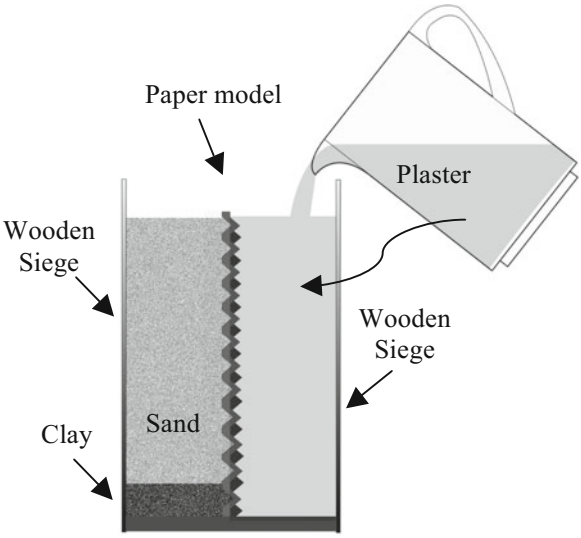

Fig. 72.5 Plaster pouring construction

artist's impression in both two (2)- and three (3)-dimensional drawing. From here, the selected design dimension is then transferred to the 3-D paper modelling to perform paper mock-up. This paper mock-up will then be sprayed with lacquer aerosol to strengthen its surface and make it resistant to water when wet plaster will be poured on it during plaster modelling.

Plaster is the most common base material which is favoured by ceramicists and the industry for its advantages. It can work in wet, damp or dry state although thin sheets of flat plaster can warp and do not change its shapes on drying [14]. A good polished surface can be obtained, and once in a model form, it deteriorates very little with time if it does not come into contact with casting slips and abrasive deflocculants (Sasha Wardell, 2007 – Slipcasting, Second Edition) [16]. It is important that during the plaster model process, the dissolved plaster in a state of proper pouring condition in advance to accommodate the whole surface pattern area is spread evenly especially to those spaces with critical design pattern (Fig. 72.5).

The illustration on top illustrated the process of plaster pouring on the built wooden siege in order to gain the negative relief from the paper model. This process enables the author to capture the moulded negative relief for plaster moulding purposes.

72.3 Results and Discussion

In this stage, the authors study the result of pattern quality conceived through the folding process on a plaster model and its result through analysing the cast slip model as per shown in illustration 4. The authors also observed the symbols and

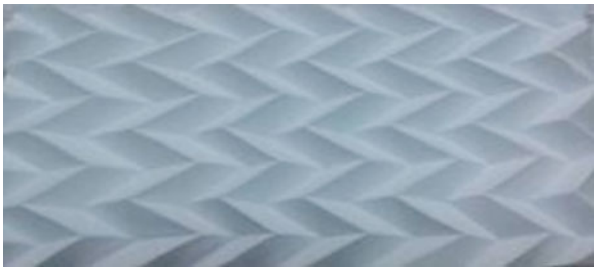

Fig. 72.6 The progression from plaster model to cast slip model

terminology that were used during the process of making a paper folding design. Throughout the observation, usually the basic symbols used in the explanatory diagrams are valley fold, mountain fold, crease, turn over or rotate, pleat fold, fold and unfold and reverse fold [13] (Robert J. Lang., Origami Design Secrets, 2012; second edition, page 11–23) (Fig. 72.6).

72.4 Conclusion

Inspired by paper folding, the experiment started from ideation, sketching and design development activities which continuously develop a new way of producing an intricate form of plaster modelling. Paper folding provides chances of replicating a rigid pattern to be applied on plaster model or form which is commonly used in production to produce ceramic products [15]. Nevertheless, this breakthrough provides creative opportunities especially to an academician who involves in ceramic production and mould making. The whole process, respectively, declares that it is through by far the closes way of adapting paper folding pattern on a form are by working folded paper model as a waste model which are easily rather than manually carve the pattern directly on plaster model.

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