An adapted pedagogical framework in utilizing WhatsApp for learning purpose

Nani Amalina Zulkanain[1] · Suraya Miskon[2] · Norris Syed Abdullah[2]

Abstract

WhatsApp is one of the most popular and widely used communication platforms today. However, from an application in a few subject areas, this mobile application (app) can be distractive and cause users to lose their focus as it attracts and promotes social interaction among learning communities. In this study, firstly, qualitative research approach which employ one group post-test design by conducting an observation method for the main experiment was carried out to gain a deeper understanding of students' responses on WhatsApp. Next, a Community of Inquiry (COI) framework was selected and applied. Then, an adapted pedagogical COI framework in utilising WhatsApp for learning purposes was validated by four experts. The findings showed that the framework positively supports the use of WhatsApp for learning purposes. The research has provided in-depth understanding of the usability of WhatsApp for learning purposes by improving teaching strategies and its application within the COI framework that is applicable for other types of social networks.

Keywords WhatsApp · Community of Inquiry (COI) framework · Learning purposes · Teaching strategies

✉ Nani Amalina Zulkanain
  amalinanan94@gmail.com

  Suraya Miskon
  suraya@utm.my

  Norris Syed Abdullah
  norris@utm.my

[1]   Faculty of Computing, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia

[2]   Azman Hashim International Business School, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia

1 Introduction

Technology nowadays is utilised for many purposes especially in communication. Communication technology has become innovative with the capability of wide connection supported by the internet and ease of us. This research sets out to further discover the use of popular instant message mobile app called WhatsApp from an educational perspective. Our prior research by Zulkanain et al. (2019) has discovered several types of Social Network Sites (SNS), which currently applied by most students and instructor for learning purpose which are Facebook, Twitter, YouTube and WhatsApp. This study continues by focussing with application that use instant message as it main function which is WhatsApp by highlighting the research question, *"How could the pedagogical framework can be utilized in supporting WhatsApp for learning purpose?"*. The main objective in this study is to propose an adapted pedagogical framework in WhatsApp for learning purpose. WhatsApp can be described as a tool to interact with friends or instructors about specific topics, where the chats and sharing of information take place mostly in WhatsApp groups created by an administrator (admin) (Najafi and Tridane 2015), as well as a platform for guiding the lesson learnt or consultations (Nitza and Roman 2016). Barhoumi (2015) states that WhatsApp in learning covers the collaboration and cooperation between students and instructors in a class or at home. This will further examine the capability of WhatsApp as a platform for learning purposes and adapt the use of pedagogical framework to support learning process.

As WhatsApp is still new as a learning tool, students lack training or references to use the app for this purpose (Altaany 2015). An excessive number of questions asked and comments made (Al-Omary et al. 2015) while learning on WhatsApp often lead to confusion and misinterpretation of statements. It somewhat of distracts (Dar et al. 2017) because most students can use the app to learn anywhere and anytime without an instructor's guidance (Alt 2017). Some students think that WhatsApp disrupt their personal life and would rather interact with an instructor or friend as usual in class (Khatoon et al. 2015). Some students can become demotivated with the lack of response from the instructor even though the instructor already in the WhatsApp group (Deibert 2015). However, there are no specific pedagogies on the suitability of WhatsApp to be adapted for learning purposes. Thus, this research suggests the use of a pedagogical framework in WhatsApp application to test the validity and its benefits for learning.

To reinforce the statement above, the study by Tezer et al. (2017) shows that social network can be a suitable platform for academic success provided the correct method is applied during learning. In a study conducted by Robinson et al. (2015) and Jaafar (2017), which found that most students prefer to use WhatsApp for learning purposes, many researchers recommend the creation of guidelines to support learning in WhatsApp which will enable students to keep up with their learning without any distractions (El Bialy and Ayoub 2017; Dar et al. 2017). Another study also suggests to focus on the instructor's role in WhatsApp as the main catalyst to attract students' attention (Robinson et al. 2015), while research by Smit (2015) added that the attention the teaching style of an instructor will affect students' interest in learning. This shows that WhatsApp has the potential to grow as a platform for learning in education. Based on the finding described above, the main research question was derived from the

intention to study the use of WhatsApp for the purpose of learning with the use of a pedagogical framework.

COI was introduced by Garrison et al. (1999) which was specifically intended to facilitate valuable online learning. The objective of this framework is to provide a valuable educational experience (occurrence of learning) among students with three overlapping elements (also called presence), namely social presence, cognitive presence and teaching presence. This study explores COI framework as a pedagogical framework to support WhatsApp as a learning platform as it provides an educational experience through teaching presence, social presence and cognitive presence as it promotes the elements that can be beneficial for both instructors and students. Furthermore, it is focused on educational experience that not only highlights academic performance but also social skills as well as adaptability for teaching skills. Teaching presence highlights the ability of instructor to design and facilitate students in providing worth and meaningful learning outcome. Social presence focuses with the ability of communicate in community and establish inter-personal skills and cognitive presence can be defined as the ability of learners to understand and able to give meaning through reflection from learning. Rap and Blonder's (2017) study shows that learning can occur if these three presences are fully utilised and well adapted. This framework has been adapted for many avenues of learning such as in e-learning, blended learning, physical learning, flip learning, learning in social networks (Scott et al. 2016a) and virtual world leaning (McKerlich et al. 2011). A recent study by Keles (2018) on social network platform Facebook, shows that it supports teaching presence and the socialisation process through groups which also certainly indicates social presence. In addition, online discussions that apply the COI framework are much more comprehensible and brief as well as make participants feel comfortable to speak-up in online conversations (Warner 2016). The COI framework has been applied in several social network platforms and thus variety of indicators has been tested by researchers on producing a better learning environment. Many perspectives of indicators form to create better learning performance thus, providing a valuable educational experience to students. As the COI framework is strongly focused on adaptation in education, this justifies its use in a part of this research to support WhatsApp application for learning. This framework proposes and examines the use of WhatsApp to be applied for learning purpose.

2 Methods

The use of experiment in this research was to observe the reactions of participant in the context set by the researcher to which the expected results (Schneider 2013). An adapted COI framework indicator is applied to test the use of COI framework for learning purposes in WhatsApp. Schneider (2013) mentioned that having the guidelines can help researchers to guide their behaviour in the experiment. This experiment use the one-shot case study by Campbell and Stanley (1966), also known as the one-group post-test only design by Privitera and Ahlgrim-Delzell (2019) which includes only one group to observe the whole context until the end.

2.1 Participants

Since only one group is observed in one time, a few number of participants are able to involved for giving a quality qualitative data through observation. All 13 participants (six females and seven males), were enrolled for the subject of Research Methodology from the Faculty of Computing. Two instructors were also involved. All participants were invited to join WhatsApp group with the name of *ITM-Research Method*. Both instructors applied an adapted COI framework indicator and all the responses were observed for five weeks.

2.2 Procedures

All observations were conducted through the WhatsApp group described above. This is because the creation of an online community is important in providing a good learning experience (Garrison et al. 1999) and the ability to learn in a group can encourage social relationships in the form of collaborations between members (Kim and Kim 2013; Lim and Richardson 2016). Furthermore, discussions in a social network group allow different perceptions to be expresses and arguments to be presented which may help participants to gain critical thinking skills (Tsovaltzi et al. 2015). It is easy to share information and materials in a group, which are sent to all group members simultaneously (Lim and Richardson 2016) and this can increase knowledge through the sharing of ideas and concept of learning (Rasiah 2014).

This experiment focus on the observation of individual communication in WhatsApp. A study by Wang et al. (2015) found that shy individual also do become involved in communication but with passive engagement as they feel uncomfortable and are insecure about being evaluated by others. They also socialise less with others, and tends to be more sensitive, nervous and emotional (Shen et al. 2015). Tsovaltzi et al. (2015), on the use of Facebook, stated that students tend to have their own individual solution or arguments before comparing them in a group discussion. This shows that they are gaining their confidence individually.

As different students have different personalities and also tend to have different levels of self-disclosure, the main experiment was set-up to capture two situations, namely in WhatsApp group and WhatsApp individual (through personal messages made directly to the instructor in WhatsApp). Even for individual communication, the instructor also applied an adapted COI framework indicator. The use of private message methods with the application of the COI framework was also tested by Oztok et al. (2013) to discover learning through group discussions and private message, which is between two individual. The study discovered that students who are active in the group discussion also active in the private message mode. Furthermore, the paper argued that it is impossible to utilise all the COI elements in private mode, which involves only two individual. However, learning occurs when students engage in either mode because they complement each other in filling the social gaps, either in private or in group relations. Another study by Armellini and De Stefani (2016) discovered that students tend to participate in group discussions in which the instructor applies the COI framework. However, they also tend to reply privately using private message whenever the chat involves only two people, the instructor and the respective student. This is because they do not want their message to be read by their other friends. This happen

when the instructor applies cognitive elements but the students facing with the social issues thus, require private attention from the instructor. Based on the findings above, most students are involved in discussions through a community in a group and the use of COI framework is possible in private message mode. However, both can only contribute to the occurrence of learning experience only if the students are involved in both group and private chats, where both responses are accepted and observed. Table 1 below shows the overall procedure for the main experiment.

2.3 Analysis

Data obtained from observation in the main experiment were analysed within NVivo in a deductive manner using thematic analysis technique, which involved the use of COI framework. In this study, an adapted COI framework indicator was applied to support the coding and analysis of participants' responses from the experiments. All the indicators were basically taken from the pioneering research that produce the COI framework, i.e. Garrison et al. (1999), followed by Keles (2018), Rambe (2017), Warner (2016), Robinson et al. (2015) that discovered indicators in several other social network platforms. The specific codes were used to avoid confusion and to facilitate the tasks of checking and comparing. All the data are then sorted according to the respective indicators. Each response is categorized based on indicator used and separated according to the respective elements which are cognitive presence, social presence and teaching presence.

2.4 Framework validation

Framework validation focuses on the trustworthiness aspect needed to validate findings. Roberts and Priest (2006) added that respondent validation is useful in checking and approving findings that are consistent with their interpretations and experience. This research takes a stringent approach in having four experts to validate the findings of the experiment by using adapted COI framework indicators to sort all the data and analysed them using a thematic analysis. This is supported by Elo and Kyngas (2007) who stated that findings in qualitative research and subjective answers should be validated by seeking the approval and agreement of expert (Graneheim and Lundman

Table 1 Experiment Procedure in WhatsApp

Steps	Procedures
1	Participants are informed that they are allowed to share any announcements, information or materials in the respective WhatsApp group. They also can ask the instructor any questions or discuss with members anytime. Both Malay and English are allowed.
2	A participant create WhatsApp group with the name of *ITM-Research Methodology*.
3	The instructors apply an adapted COI framework indicator while asking questions or replying to the participants' responses in the WhatsApp group.
4	WhatsApp private messages are accepted from individual participants.
5	All responses are observed and recorded.

2004). Cloquell-Ballester et al. (2006) mentioned that a minimum of two experts and a maximum of eight should be involved.

3 Findings

The main aim of this research is to propose and validate an adapted pedagogical framework in WhatsApp application for learning purpose. Based on the results, all three elements are well used by instructor along main experiment session. Some of the responses indicate to several different indicators. This is because these responses consist of wide context and meaning that can indicate from several indicators. These responses are then categorized according to indicators that majoring focus during conversation. Most participants are response in WhatsApp group and only three participants actively interact through WhatsApp individual. The instructors are successfully to applied most of the indicators that inhibits the acts to produce valuable learning.

3.1 Cognitive presence

Cognitive Presence code as CP is an important element in deliver quality knowledge. All results are listed in Table 2 below.

3.2 Social presence

Social Presence code as SP relates to social interaction that encourages communication and the maintenance of positive relationships among instructors and participants. All results are listed in Table 3 below.

Table 2 Results Summary from Cognitive Presence

Categories	Adapted COI Framework Indicators	Summarization of Participants' Response based on Indicator Used
Triggering Events (TE)	Sense of puzzlement (CP-TE-1)	• Lack of response. • Participants are not interesting to answer.
	Give assignment (CP-TE-2)	• Lack of response and not ready to submit.
Exploration (EX)	Information exchange (CP-EX-1)	• Eager and confident to share opinion.
	Ask questions (CP-EX-2)	• Able to describe their topic based on specific questions asked.
	Introduce external material to support point (CP-EX-3)	• Supported participants' understanding. • Received appreciation post.
Integration (IN)	Connecting ideas (CP-IN-1)	• Able to discover and justify new ideas.
	Support others claim (CP-IN-2)	• Participants felt confident to express themselves and put forward their statements.
Resolution (RE)	Apply new ideas (CP-RE-1)	• Able to think with deeper insight and come out with own new ideas. • Received appreciation posts.
	Interpretation of practical application (CP-RE-2)	• Received excessive positive responses and concerns on the instructor's opinion. • Resolved the misunderstanding.

3.3 Teaching presence

Teaching Presence code as TP refers to the instructors' teaching methods in delivering knowledge to participants. Based on the results, there was an excessive number of positive responses received from the participants. All results are listed in Table 4 below.

4 Framework validation

The validation session with the experts was focused particularly on validating the summary of results gathered from the main experiment. The four experts selected have Information Systems background and also have experience in having WhatsApp conversations with students both in a group and individually. Most of the experts have more than ten years' of experience in the education platform.

Table 3 Results Summary from Social Presence

Categories	Adapted COI Framework Indicators	Summary of Participants' Response based on Indicator Used
Emotional Expression (EE)	Emotions (SP-EE-1)	• Comfortable expressing problems. • Encouraged understanding and motivation.
	Sense of humour (SP-EE-2)	• Received emoticons in response to show happy feelings.
	Share something unrelated with course (SP-EE-3)	• Lack of response. • Appreciation responses.
	Use of emoticon (SP-EE-4)	• Responses using emoticons. • Responses with deeper insights.
Open communication (OC)	Risk-free expression (SP-OC-1)	• Responses with emoticon to express feelings.
	Comments on other member shares (SP-OC-2)	• Received appreciation posts.
	Express appreciation (SP-OC-3)	• Received emoticons
	Make announcement (SP-OC-4)	• Received excessive response and questions.
	Like-symbol (SP-OC-5)	• Received appreciation post and emoticons.
	Express agreement (SP-OC-6)	• No response.
Group Cohesion (GC)	Encouraging collaboration (SP-GC-1)	• Participants shared opinions with each other.
	Sharing experience (SP-GC-2)	• Gained motivation • Receive appreciation post
	Share about group project or product (SP-GC-3)	• No response
	Greetings (SP-GC-4)	• Lack of greeting response • Direct responses to the questions
	Using inclusive pronouns – we, our, us (SP-GC-5)	• Gained motivation. • Received appreciation posts.

Table 4 Results Summary from Teaching Presence

Categories	Adapted COI Framework Indicators	Summary of Participants' Response based on Indicator Used
Instructional Management (IM)	Defining and initiating discussion topics (TP-IM-1)	• Received response in the form of answers to questions from the same person.
Building Understanding (BU)	Sharing personal meaning (TP-BU-1)	• Able to understand well and ask related questions.
	Share text, video, URL and photo-increase awareness (TP-BU-2)	• Received appreciation post
	Debate through question to encourage perspective (TP-BU-3)	• No response
	Ensure the discussion took place with reference to the objectives (TP-BU-4)	• Interested to know more about the topic and share respective knowledge.
Direct instruction (DI)	Focusing discussion (TP-DI-1)	• Responded only when the instructor asked questions.

4.1 Cognitive presence

Cognitive presence consists of four categories and all the indicators were accepted by a majority of the experts. A few of suggestions were received from the experts. Expert 2 suggested changing the position of 'sense of puzzlement' with 'give assignment'. This is because in most situations, giving an assignment comes first before sense of puzzlement arises. This is to avoid any confusion for the instructor to use these indicators as reference. Expert 4 commented regarding the 'give assignment' indicator that all assignments only can be done based on a timeframe given and suggested that the instructor should state the deadline to ensure that all students are given the specific time to complete all the assignments.

4.2 Social presence

The validation results from social presence showed that most indicators were accepted by the experts. However, Expert 3 rejected the results for 'share something unrelated' from the course indicator, commenting that the indicator will not contribute to the learning process. The same experts also rejected the results for 'express agreement' and 'greetings' indicators. Furthermore, comments received from Expert 4 regarding participants' response from the 'greeting' indicator, stated that the response will be dependents on the students' background such as age and gender. Overall, all indicators were accepted to be used in WhatsApp for learning purposes.

4.3 Teaching presence

The validation results from teaching presence showed that most indicators were accepted and can be used in WhatsApp for learning purposes. Expert 3 rejected the results for 'debate through questions to encourage perspective' while Expert 4 stated that the instructor needs to be creative to trigger a debate between the students. Expert 4

also commented that students would normally ask unrelated questions under the 'focusing discussion' indicators.

5 Discussion

The main purpose of this research is to propose and validate a pedagogical framework for learning purposes. Based on the results as illustrated in the previous section, all indicators are accepted based on the majority acceptance among four experts and can be used to support learning purposes in WhatsApp.

Cognitive presence showed overall positive response in all indicators used and so the validated results showed that all indicators were accepted by majority. All these positive responses suggest that educational experiences do occur on WhatsApp. Each indicator from each category used by the instructor shows the ability of students to engage with course objectives and enhance critical thinking according to the topics discussed (Keles 2018). Both indicators from the Triggering Event (TE) category received little response but, based on comments from the experts, it was just a matter of having the instructor impose a deadline to complete all the assignment given. Response from students may have not been forthcoming as they were still probably in the process of completing the tasks. Indicators used in the Exploration (EX) category showed that instant communication makes all the distribution of information easy and gives students the perception of learning with quality materials. This literally supports communication and collaboration among the students (Rambe 2017). In addition, the use of indicators in Integration (IN) category provided the opportunity for students to discover new ideas following their own interpretation regarding the issues and problem discussed among themselves and also with the instructors. This shows that these indicators enhance critical thinking skills among students. The Resolution (RE) category suggested new insights in learning and showed the correct ways of learning through a practical application which is necessary for providing an opportunity to students to engage through the correct learning process to achieve their learning objectives (Keles 2018).

Social presence supposedly supports social interaction and emotion among students and instructors. All indicators from the Emotional Expression (EE) category relate to personal emotions which mostly generated similar feedback to the instructor. By expressing emotions, other students are able to understand the current problems face by their friends and would allow them to know and understand each other better (Keles 2018). The 'share something unrelated with course' indicator was rejected one expert with the comment that it does not contribute to the learning process. However, a statement from Robinson et al. (2015) justifies that literally any form of social interaction is essential in developing relationships among members and facilitates socialisation to enhance learning. Most responses received from the Open Communication (OC) category were in the form of emoticons, appreciation posts and questions. This suggests that the students were comfortable to respond and ask questions to further enhance their understanding. It is worth nothing that a lack of response does not necessarily indicate less understanding and in real situations, perhaps students can even can learn and understand without commenting during the discussion session (Scott et al. 2016a). Results from the Group Cohesion (GC) category suggest that

collaboration among students enhances motivation to gain understanding. Activities among group members certainly increase the social interaction among peers and instructor which would eventually contribute to the development of social skills (Keles 2018).

Teaching presence is necessary for the facilitation of learning to ensure students are in line with course objectives. The Instructional Management (IM) category allowed the instructor to initiate the learning topics and thus, students were able to respond according to the instructor's initiation. The Building Understanding (BU) category showed that the instructor's ability to raise discussions in line with the topic was able to facilitate higher level thinking (Keles 2018). Although the 'debate through questions' indicator received no response, it could still prompt students' thinking skills towards deeper insights and the results were accepted by majority of experts. As no responses were received, this prompted a suggestion from Expert 4 who asked the instructor to be more creative in asking the right questions to trigger a debate. Direct Instruction (DI) category, it was discovered that the ability of the instructor to give instructions affected the students' focus on the topic. A few of the responses received, indicated that some of the students did not understand the instructions given although they did not comment or interact with others during the discussion session (Scott et al. 2016b).

According to the validated results, all indicators were accepted and thus, shows that all categories and elements proposed in the COI framework can be used in WhatsApp for learning purposes. This suggests that an educational experience occurs among students through WhatsApp interaction. In summation, this framework validation session provides deeper insights into the acceptance of a pedagogical framework to enhance WhatsApp for learning purposes. The use of experts to validate the results can enhance trust and understanding on this new platform of social network adapted for education.

6 Conclusion and future works

This research contributes to teaching and learning benefits for both instructors and students in a social network platform. Moreover, the wide use of WhatsApp suggests an opportunity to adapt the learning approach on this platform. The description of this information will be valuable for current educators to apply social network for education according to trends of technology. The use of a pedagogical framework in this research, certainly supports the application of on WhatsApp for learning purposes. As the popularity of instant message increases, it can be used to fulfill the opportunity in adopting social networks for educational purposes. This research could be extended to be tested on the WhatsApp application but with students as the individuals who apply the indicators instead of instructors. This is to encourage the learning process among students without the presence of their instructors. This is also beneficial for individual learning without help from instructors, on an informal basis.

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