

Chapter 6

Tooling Kenya's Jua Kali Sector: Artistic Learning for Enhanced Design Practice and Planning Using Reflective Practice



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Abstract The multi-sectorial, informal sector in Kenya is commonly referred to as the Jua Kali Sector and consists of micro and small enterprises. The manufacturing subsector of the Jua Kali Sector is a crucial source of employment and livelihood for many people in Kenya, East Africa. The sub-sector's potential to impact social and economic development is inhibited by a lack of technical and business skills in design practice and planning. The need for skills development in the informal sector is a recurrent theme in the Kenya Vision 2030 and UNESCO's Sustainable Development Goal (4) regarding quality education, inclusive and equitable education, and the promotion of lifelong learning opportunities for all. This chapter reports the use of an action research cycle to develop a competency-based design training framework for developing skills and knowledge to address the rapidly changing needs of artisans in the Jua Kali sector. The model will ensure equal access to affordable and quality education, enabling artisans to acquire relevant employment and entrepreneurship skills for the labor market.

Introduction

The informal sector in Kenya or Jua Kali Sector consists of micro and small enterprises. The sector has the potential to become a seedbed of innovation, on-the-job training, and entrepreneurship while contributing to sustainable economic growth and creating employment opportunities for the semi-skilled labor force (Mang'unyi et al., 2018). Of the country's 19 million workforce, the sector employs 14.9 million yet contributes to only 18% of the Gross Domestic Product (Kenya National Bureau of Statistics, 2018). The term "Jua Kali" means "hot sun" in Kiswahili, which reflects the semi-organized, small-scale activities by artisans who are unregistered, and unregulated (Juepner et al., 2018; Maina et al., 2017). Unlike formal businesses, Jua

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Kali Sector enterprises lack infrastructural facilities, access to credit (Magambo & Omwenga, 2015), training and technologies (Kanana, 2019), and use unconventional operations and transactions (Nyakamba et al., 2017). The sector has evolved into four sub-sectors: manufacturing, services, trade, and agri-business (Ndung'u et al., 2011). One of the key challenges facing artisans in the manufacturing sub-sector is the lack of access to affordable structured and flexible design training for enhancing the skills they acquired through traditional apprenticeships (TA) (Ngure, 2018). Consequently, most artisans develop design practice and planning skills outside the formal education sector, mostly on-the-job and from fellow semi-skilled or unskilled artisans. This chapter focuses on skills development in the manufacturing subsector of the Jua Kali Sector, the existing design skills gaps and/or mismatch, and a proposed framework for bridging the gaps.

Skills Development in the Jua Kali Sector

The skills inadequacy or mismatch amongst the artisans in the subsector is mainly attributed to the education system that has focused on developing graduates for the shrinking formal labor market. The artisans, therefore, lack technical and business skills, which they need to create competitive and sustainable products. The need for upscaling the artisans' skills has received significant attention both globally and locally. Globally, UNESCO's Sustainable Development Goal 4, Education (UNESCO, 2020), aims at ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. Sustainable Development Goal 4 also seeks to increase and diversify learning opportunities, by offering learners a wide range of education and training modalities to acquire relevant knowledge, skills, and competencies for decent work and life.

Locally, the need for enhancing the Jua Kali Sector artisans' skills is captured in the Kenya Vision 2030, which aims to transform Kenya into an "industrialized middle-income country providing a high-quality life to all its citizens in a clean and secure environment" (Republic of Kenya, 2008, p. 16) and to substantially increase skilled workers in both technical and vocational aspects by 2030. The Vision was launched in 2008 and is based on three pillars: the economic, social, and political. Skills development in the Jua Kali Sector is factored under the social pillar of the Kenya Vision 2030, which outlines the need for providing the sector's players with education and training to increase their productivity. The Vision seeks to have more youth and adults with relevant skills, which include vocational and technical skills for entrepreneurship and/or acquiring decent employment by 2030 (Kenya Vision 2030 Secretariat, 2007).

The skills enhancement need is also reflected in Kenyan government documents which recommend reformation of education and training sectors to provide for the development of learners' potentials in a holistic and integrated manner while producing intellectually, emotionally, and physically balanced citizens. It is also recommended that education be based on a competency-based curriculum, which

would promote individual development and self-fulfillment and provide opportunities for learners to develop to their fullest potential. Furthermore, the education ministry in Kenya is also charged with the implementation of the Technical, Vocational Education and Training infrastructure, and to oversee various aspects of the education sector, including providing complementary education for gaining technical skills in the form of on-the-job training, capacity building, and life-long employability of graduates. The Government also launched the new curriculum in 2018, aiming to shift the focus from a subject-based approach to a competency-based one (Owino, 2018). The Government seeks to reduce unemployment by nurturing every learner to acquire competencies capable of promoting national values and inspiring individual innovation and lifelong learning. However, exploitation of the Jua Kali Sector's full potential requires government interventions for funding, infrastructural expansion, and more importantly, skills development. These developments are essential considering the artisans' challenges such as lack of training in design practice planning and because their education is often limited to narrowly-focused traditional apprenticeships. This chapter focuses on addressing the limitations of the apprenticeship system, through enhancing skills development in design education.

Both global and local perspectives emphasize the need to develop human capacities in terms of skills and competencies for socio-economic development. This is occasioned by the rapidly changing labor markets, growing unemployment, immigration, technological advancement, and changing demographics characterized by an aging workforce, particularly in western countries (United Nations, 2020). In many countries, education and training policies are also expected to address rapidly changing needs for youth and adults to improve their skills and learn new ones (OECD, 2020). Consequently, it is imperative to increase and diversify learning opportunities, using a wide range of education and training modalities to acquire relevant knowledge, skills, and competencies. With Kenya being no exception, equitable access needs to be expanded while quality is ensured. Technical, Vocational Education and Training systems must recognize and value skills acquired through experience or in non-formal and informal settings, including in the workplace. In Kenya, the responsibility for the implementation of Sustainable Development Goal 4, Education, lies at the national level.

Artistic Learning in the Jua Kali Sector

As apprentices, the artisans learn from the master craftspeople by continuously developing tacit and tactile design competencies through practical experiences that involve observing, imitating, and interacting with the master craftsman, with few theoretical explanations. The tacit knowledge is acquired and absorbed experientially and is transferred when the artisans touch, feel, reflect, and become engaged through face-to-face interactions with the master craftsman. The apprentice self-evaluates by reflecting on acquired competencies before proceeding to the next level. Hall and Simeral (2017) identify that reflective practice in design emphasizes

reflection-in-action; thinking and doing are complementary, with each feeding the other while undertaking a design task. Therefore, reflective practice is an inevitable ingredient of traditional apprenticeships considering the practical nature of the learning and the apprentices' interactions with the master craftspeople.

The development of the Design Training Framework (DTF) described in this chapter aimed at enhancing the artisans' capacity by looking back at the knowledge and skills they had acquired and by proposing ways of enhancing them. The DTF was designed to complement the traditional apprenticeships because it provides learner-centered, simplified, modularised well-structured content that can support training through artisans reflecting and building on their tactile performance.

Methodology

The study adopted a combination of qualitative research methods and the Action Research Cycle (ARC) to develop the Design Training Framework (DTF). The qualitative research methods were used to provide perspectives of design practices and planning across similar clusters in the different JKAs, thereby acquiring an in-depth understanding of the artisans' tacit skills. A sample of 86 participants was purposively sampled from 18 Jua Kali Associations. As indicated in Table 6.1, the data from this

Table 6.1 Distribution of data collection tools and respondents (from author's fieldwork)

Data collection tool	Category of respondents	No. of respondents/groups
Semi-structured interviews	Artisans <ul style="list-style-type: none"> • Handicraft (28) • Woodwork (14) • Metalwork (22) • Ceramics (18) 	<ul style="list-style-type: none"> • Nairobi County (29) • Kisumu County (35) • Siaya County (10) • Homa Bay County (14) • Kisii County (5) Total Respondents (86) Total Jua Kali Associations (18)
Focus group discussions	Artisans <ul style="list-style-type: none"> • Woodwork • Handicraft • Metalwork 	<ul style="list-style-type: none"> • Kibuye Jua Kali Association • Nairobi Handicraft (8) • Kamukunji Jua Kali Association (7)
Non-participant observation	Recorded all participants in their workshop	

sample were collected using semi-structured interviews, focus group discussions, and non-participant observations.

The Action Research Cycle (ARC) was used to develop the Design Training Framework (DTF). Crouch and Pearce (2012) note that the ARC is a participatory design that mainly focuses on empowering individuals through democratic design processes and aims at broader social and systematic change. Such flexibility was appropriate because of the artisans' education level, the diversity of the products they make, and their location. The ARC enabled the artisans to focus on design problems that were most relevant to them; its iterative process allowed successive phases to build on previous phases through asking questions, shooting videos and audio recording and making any necessary refinements (Coghlan, & Shani, 2018). The processes granted ownership and control to the Jua Kali artisans, improved the understanding of the traditional apprenticeship skills development process, and the master craftsperson/apprentice relationship in the manufacturing sub-sector.

This research adopted the observation and reflection stages of the ARC (Crouch & Pearce, 2012) for the content development of the DTF. It brought on board Jua Kali artisans with various levels of education and educationists who are subject experts and government officials to support the development of the DTF through a collaborative problem-solving process (Coghlan & Shani, 2018). The DTF is expected to enable artisans to manage and consolidate their design practice.

Observation and Findings

The observation stage involved a situational analysis of the Jua Kali sector, to identify where the design skills and skills gaps of the artisans were. The observation involved the identification of unique characteristics of skills development during traditional apprenticeships and provided insight into the master craftsperson/apprentice relationship (Coghlan & Shani, 2018). The findings from the observation phase revealed that Jua Kali artisans resort to acquiring tacit knowledge and skills through traditional apprenticeships, with eligibility based on social networks, rather than pre-identified skill needs. Traditional apprenticeships have resulted in a cycle of poor skills development in the sector, with the artisans insufficiently prepared for the labor market.

The artisans create products with minimal or no prior knowledge of how to identify and define the design problem through market research. They lack skills for undertaking the complex processes of market research; their products, therefore, are not determined by market demands, pricing, functionality, and aesthetics to make them competitive. Conducting such market research will enable the artisans to create briefs that help evaluate and articulate customer needs and specify requirements for suitable products (Erickson, 2017).

Briefs would allow the artisans to generate good ideas and then capture them with proper guidelines—whether they be verbal, written, sketches or models—and include the requirements of the client about a particular product. It is vital to have some

kind of documentation of ideas, to facilitate the generation of good ideas through developing concepts, visualizing, clarifying, and testing their thoughts. Traditional apprenticeships do not train the artisans on the importance of developing a brief that has sufficient information about which methods artisans could use for idea generation. Idea generation requires collaborative and divergent thinking for the idea to be wholesome and relevant to the design problem. A significant number of artisans do not go through the concept development stage to synthesize findings into a solution by addressing the brief. This gap is attributed mainly to traditional apprenticeships, which do not encourage creativity, explanation, and discussion.

The findings also indicated that the artisans' production processes were unstructured, with a lot of trial and error. The artisans do not follow through a series of steps in the actual manufacturing process; artisans source material and go straight into production. In traditional apprenticeships, their acquisition of knowledge starts with an informal agreement with the master craftsman, who they observe and imitate to acquire tacit skills and knowledge. Though some products may require prototypes, the majority of artisans do not make prototypes because they feel it wastes time and money.

The findings showed that most of the artisans had challenges in creating and building a strong customer relationship and connecting with markets due to inadequate marketing knowledge. They depend on word-of-mouth and product exhibitions for walk-in customers. They also lack the information and communication technology skills to enable them to market their products online. These issues disconnect Jua Kali artisans from markets and mean they cannot get feedback on their products. Their markets risk saturation due to intense competition occasioned by the similarity of their products. The artisans also lack proper organizational structures that can ensure success in their design planning, and the majority operate their enterprises from hand to mouth.

Reflection

The second stage of the ARC consisted of reflecting on the challenges the artisans face and proposing ways of enhancing their existing skills. It involved thinking through the identified challenges as an academician. The challenges formed the basis of the content for the Occupational Standards of the General Areas of Competencies for the competency-based DTF to teach design knowledge and skills (Haralambie, 2016).

The findings from observation informed the choice of Competency-Based Education and Training (CBET) as a framework for training the artisans. CBET was selected to complement traditional apprenticeships because it is learner-centered, self-paced, practically oriented learning with measurable learning objectives. It contains theory to provide the learner with the underpinning knowledge to supplement their practical design knowledge and competencies. CBET focuses on metacognitive awareness in an experimental learning process that sustains the transfer of learning outside the classroom environment. In CBET, all learners can master the

required competencies provided they are given sufficient time, and the appropriate training methods are applied. It develops the learner's ability to choose and apply skills and knowledge in realizing a task or work function within a particular domain. Accordingly, the DTF can provide second-chance education opportunities for artisans with limited schooling and inadequate design practice and business skills, by enabling them to pursue studies they deem relevant.

The DTF was developed using CBET's functional analysis methodology. The critical tasks were identified, and their complex functions were derived. The complex processes were further broken down into smaller components and parts to define the outcomes of an activity, without necessarily specifying the context of the action (Haralambie, 2016). This resulted in basic or simple tasks that were derived from the complex functions, making up the design of the competence standard.

The development of the Occupational Standards began with the identification of all the occupations in a particular sector. In the Jua Kali Sector, it started with the profiling of occupations. The evaluations highlighted a lack of Occupational Standards in the Jua Kali sector, and CBET provided the framework through which to instill such standards by describing the best practices, principles, and values to be achieved at different levels of design process planning. The Occupational Standards guided the generation of the General Areas of Competencies or modules. General Areas of Competencies represent the key competencies that artisans must learn to become accomplished craftspeople. Modularised content is provided for learning in the workplace of the Jua Kali artisans by educating the apprentices on how to build on their existing knowledge and skills through understanding theoretical concepts, and systematically demonstrating the design process (Dadi, 2014).

Each module contains a broad scope of knowledge and incorporates the application of the varied skills acquired, and activities to help the learner understand the design concepts and make the learning process simpler and enjoyable. The General Areas of Competencies were further broken down to determine functional units or thresholds because the structured design knowledge is relatively new to the Jua Kali sector and can be troublesome to the artisans since it is conceptual, difficult, unfamiliar, inert, and tacit. Functional units have learning unit specifications, where the artisans are expected to demonstrate knowledge and skills, after which they are taken to the liminal space. The functional units were further divided into sub-skills or elements with learning outcomes that enable artisans to demonstrate that they have reached the required threshold. The units and sub-units serve as ladders or miniature catalysts for change, as shown in Table 6.2.

The DTF proposes to build strong intellectual connections amongst the Jua Kali artisans, which, according to Mantell and Scragg (2018) would help them reflect and make inquiries about relevant design processes both as learners and teachers. Its modularized framework aims at prompting the artisans to identify their design needs and select the appropriate modules. Crotty (2012) states that this happens whenever the learner is actively engaged in the learning process through interpretation and interaction. The DTF was designed to nurture and develop relationships in which learning is a social function facilitated by a teacher.

Table 6.2 Framework with general areas of competencies for the design training framework

General areas of competencies	Functional skills or units	Sub-skills or elements of competencies (learning outcomes)
1. Design (concept development)	1.1 Market strategy and analysis	1.1.1 Opportunity analysis—finding your market 1.1.2 Competitive analysis—identify your customers 1.1.3 Target market selection—targeting customers
	1.2 Creation of briefs	1.2.1 Functionality 1.2.2 Aesthetic consideration 1.2.3 Economic viability of the product 1.2.4 Product effects on the environment 1.2.5 Understand current market trends
	1.3 Generation of ideas	1.3.1 Design solutions 1.3.2 Conception development 1.3.3 Functionality—choose the right material
2. Production	2.1 Production design specifications	2.1.1 Choose material 2.1.2 Machines for the manufacture 2.1.3 Transportation
	2.2 Prototyping	2.2.1 Visual notes/sketches/models 2.2.2 Functionality 2.2.3 Aesthetics 2.2.4 Materials 2.2.5 Safe for use 2.2.6 Economics 2.2.7 Environment
	2.3 Manufacture/production	2.3.1 Occupational health and safety act 2.3.2 Machinery and tools 2.3.3 Workshop
	2.4 Finishing	2.4.1 Aesthetics 2.4.2 Packaging
	2.5 Operating/working condition	2.5.1 Skilled workers 2.5.2 Environment
3. Marketing	3.1 Packaging and branding	3.1.1 Define product identity 3.1.2 Provide product information 3.1.3 Express product benefits and features 3.1.4 Ensure product safe for use

(continued)

Table 6.2 (continued)

General areas of competencies	Functional skills or units	Sub-skills or elements of competencies (learning outcomes)
	3.2 Influencing the demand for the product. The marketing mix	3.2.1 Product variety 3.2.2 Product price 3.2.3 Place—good advertising 3.2.4 Promotion—distribution of the product
	3.3 Sales and marketing	3.3.1 Know your market 3.3.2 Know your competition 3.3.3 Distribution and supply chains
	3.4 Customer care	3.4.1 Accessibility 3.4.2 Effective communication 3.4.3 Assurance
4. Management	4.1 Management	4.1.1 Planning 4.1.2 Organization 4.1.3 Directing/controlling 4.1.4 Monitoring
	4.2 Planning finances	4.2.1 Setting financial goals 4.2.2 Budgeting 4.2.3 Investing 4.2.4 Insurance cover 4.2.5 Income tax consideration 4.2.6 Estate planning
	4.3 Business analysis	4.3.1 People 4.3.2 Process
	4.4 Entrepreneurship skills	4.4.1 Capital 4.4.2 Labour 4.4.3 Resources
	4.5 Procurement process	4.5.1 Buying through Imprest 4.5.2 Buying through quotation 4.5.3 Buying through tenders 4.5.4 Financial limits
	4.6 Legal and regulatory requirements	4.6.1 Procedures and requirements for establishing a business

Conclusion

As an artistic learning tool, the DTF seeks to promote intellectual engagement between the learners and their instructor, thereby enabling learners to acquire necessary explicit content to build on their tacit knowledge. The DTF focuses on developing the visual literacy of the artisan by leveraging their ability to interpret, appreciate, gather, and create images, clarify decision-making, and strengthen communication. It also adopts visual representation to communicate and accurately present specific

design knowledge sets that will address the unique needs of the artisans as the end-users receiving the content. The information will be delivered to the artisans to progressively improve their existing skills and develop new ones at their pace and convenience. The Design Training Framework will enable the artisans to take more control over their own design practice and planning process through being aware of their own personal development, by taking stock of the skills they have and those they need to develop to increase understanding of their own employability and enhance the quality and sales of their products.

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