ALTERNATIVE RESEARCH METHODOLOGY FOR PRACTICE-BASED RESEARCHERS IN PURSUANCE OF RESEARCH DEGREES IN ART AND DESIGN

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Introduction

African traditional marriages are often colorful and rich with spontaneous cultural fanfare. However, what culminates into this fanfare will have been preamble by a lot of preliminary social investigations. Globally, the custom of parents finding suitable mates for their children goes back a long way. A classical case in question is the biblical story of Isaac's marriage. "Do not choose a wife for Isaac from the women where I'm living." (Gen. 24:3). In some African traditional marriages, it is expected that before one is contracted, both families would have investigated the other. This is to ensure their daughter/son would not be getting married into a family with a history that does not meet (their) societal expectations. Such investigations are conducted via any or all of the following: hearsay, revelation, authority, and possibly, earlier experience. These investigative tools have been used as far back as civilized humans can remember. The definition and process of research might not always be as simplistic as the above illustration portrays. However, from the above illustration one can safely infer that the human being has always been a researcher.

Research

Research is the careful and deliberate collection of information, combined with its sensible treatment and interpretation, so as to address particular questions we pose about some aspects of our lives (OECD, 2015). The following reasons have been propounded as reasons for research, that is; that research is expected to be descriptive, exploratory, and explanatory and/or applied. However, they all are geared towards solving problems. The following questions underpins why people research: What is the nature of reality? What is the relationship of the researcher to that researched? What is the role of values? What is the language of research? What is the process of research? This study attempts to start a conversation bothering on the process of conducting research in the built environment. There are two main methods known for conducting research, they are the quantitative and qualitative research methodologies. The following are their key characteristics.

Key Characteristics of Quantitative Methodology

1. Numerical – Aims to discover the incidence of particular characteristics of something, and the frequencies with which they occur. The intention is to infer a relationship between these characteristics.
2. Planned – Isolates and identifies characteristics (variables) prior to data collection.
3. The instruments to be used are pre-determined and rigid.
4. Structured – Because of the rigidity of the methods used, the relationship between research and subject is made rather formal by the use of standardized procedures to ensure objectivity and consistency.
5. Objective – Analysis of the data collected relies on statistical methods for determining the probability of occurrence of the predicted relationships between variables. There is limited scope for the kind of interpretation which allows free reign to subjectivity.

Key Characteristics of Qualitative Methodology

1. Openness and Flexibility - There is no pre-determined hypothesis so there is potential for an approach that is not constrained by scope or orientation. The flexibility this permits allows

for changes to occur during execution of the research; research methods may be readily changed when deemed appropriate.

2. Communication – The communication between researcher and subject is the vehicle for the research. The relationship itself is important as it is the subject who defines the scope and flow of the research to an equal extent. The reality is constructed and interpreted within the framework of this social interaction.
3. Contextual – Communication exists within a social context that is liable to continual change. The meanings salient to communication reflect and must be understood within this context. A flexible approach to choice of research instruments is necessary.

Most researches conducted in the various Schools of Environmental Technology dotting the Nigerian higher education landscape are mostly driven by positivist methodologies. The author observes that this is not unconnected to the fact that these school's ab initio were/are populated by academics who are mainly used to positivist approaches to addressing/auditing their problems. Hence, knowledge created here were/are mainly data generating studies, devoid of praxis that should bring about tangible innovations.

Over the years, the author in the school of environmental technology has been privileged to read through a lot of Doctor of philosophy (PhD) students' research proposals; being one of the lecturers saddled with the responsibility of ensuring that PhD candidates of the school adhere to the house rules for conducting research. On some occasions the author has had to perform the role of an internal examiner, where the researcher got to discover that very few researches in the built-environment (particularly of the School of Environmental Technology) have clear cut "tangible" research intentions. The findings suggested that most research students in the built environment indulged more in "non-tangible" researches, where data gathering is their preserve, instead of building or producing things (this paper does not aver that such a phenomenon is bad, but that there is a preponderance of such is what the author finds untowardly). After so many reviews and debates with other members of the school's postgraduate advisory panel, it became pertinent to do a position paper to kick-start a discourse on what should be the likely research directions researchers in the built environment should consider adopting. This is in a bid to address the yawning purgatorial situation postgraduate students of disciplines in the built environment seem to have found themselves.

The school of Environmental Technology is one of the nine schools in the Federal University of Technology Akure. The school has eight departments, Architecture, Building Technology, Estate Management, Geo-Informatics, Industrial Design, Quantity Survey, Urban and Regional Planning, and Textile Design Technology. The departments of Building Technology and Textile Design Technology are new and are yet to start offering postgraduate programmes. Although, all these programmes have a common attribute which is that they have some form of social science connection that is; "man-made, structures and facilities viewed collectively in which people live and work". However, from the above listed programmes, only the departments of building technology, Industrial Design, Textile Design Technology and Architecture seem to have 'practice' situated at the vortex of their respective programmes. Hence, this paper intends to refer to 'them' as the Art and Design courses in the built environment. The others on the fringe of design praxis, would not be discussed directly.

	Departments in SET	
1	Department of Architecture	8
2	Department of Building Technology	0
3	Department of Estate Management	12
4	Department of Geo-Informatics	1
5	Department of Quantity Survey	4
6	Department of Industrial Design	27
7	Department of Textile Design Technology	0
8	Department of Urban and Regional Planning	5
		57

Table 1: List of departments in SET and PhD titles reviewed from the respective departments

Over time, these practitioners on the fringe of design practice have in some way influenced and determined the kind of research encouraged in these schools. The reason is not unconnected to the fact that they are older departments and have helped nurture these other departments. Hence, the influence on them. The author remembers witnessing a candidate being queried in the past for conducting a practice-based design study which involved the development of an instructional package to teach ceramic students. A Professor of Urban and Regional Planning had scathingly wondered why the industrial design department should indulge in studies that bespeak a study in the Department of Education. He had perhaps failed to appreciate that the author was conducting participatory action-based research (PAR), in which the researcher was attempting to produce an artefact meant to address a problem. The PAR suggested that some form of co-creation process occurred i.e., with other stakeholders in the study area, in this case; there were students, other lecturers, the curriculum, equipment and demonstrators. All performed as actants who socially converged to create knowledge in solving a problem experienced in a sister department.

Investigations revealed that a high percent of the PhD researches (73%) conducted used quantitative research approaches or related. Of the fifty-seven (57) odd PhD proposals perused, more than thirty-five (35) suggested an involvement or conduct of some form of survey research study (Quantitative research), with the candidates either assessing, evaluating, or examining a social phenomenon. About twenty (20) of the titles suggested that some form of creation, building or design and development was involved in the research. Additionally, the studies showed that the researchers had a preponderance for approaching hitherto socially induced phenomena from mostly positivist perspectives, (including most of the twenty). Thus positioning the respective researchers to rely on the use of mostly numerical data to record and report upon human interactions, acquisition of skill-sets, social perceptions and behaviour. Furthermore, this accounts for why most data generated, and analysis done often end up as just numbers and hardly a substantial contribution to the built environment where academics are expected to be the gate keepers. The above does not diminish the importance of survey driven researches as they also have their worth in policy development and social enlightenment. However, a developing economy would appreciate if a lot of research is directed at addressing physical (infrastructural) and technological challenges, which our kind of research direction is not addressing.

Freq	Word	Freq	Word	Freq	Word	Freq	Word	Freq	Word	Freq	Word
16	assessment	2	multifunctional	1	journals	1	grain	1	dearth	1	lease
12	development	2	natural	1	persuasive	1	particle	1	nigerian	1	map
8	production	2	dyes	1	computer-generated	1	size	1	area	1	tertiary
7	ceramic	2	methods	1	imagery	1	forming	1	kaduna	1	educational
7	evaluation	2	enhanced	1	children's	1	technique	1	companies	1	allocation
6	textile	2	photography	1	behaviour	1	porcelain	1	animation	1	public-private
5	textiles	2	case	1	designing	1	insulator	1	usage	1	partnership
5	selected	2	study	1	afrika	1	waste	1	new	1	ppp
5	property	2	firms	1	creating	1	functional	1	normal	1	procured
5	residential	2	real	1	ideographs	1	entrepreneurial	1	enhancement	1	mass
4	materials	2	estate	1	interactive	1	activities	1	campaign	1	knowledge
4	management	2	coastline	1	inspired	1	women	1	inflation	1	maturity
4	using	2	features	1	afrikan	1	cottage	1	hedging	1	quantity
4	impact	2	proximate	1	proverbs	1	sanitary	1	capability	1	surveying
4	effect	2	rental	1	multimedia	1	wares	1	investment	1	modelling
4	performance	2	appraisal	1	application	1	utilization	1	tiling	1	local
3	design	2	land	1	maternal	1	sustainable	1	institutional	1	tropospheric
3	advertising	2	housing	1	care	1	industrial	1	barriers	1	delay
3	buildings	2	factors	1	delivery	1	growth	1	operations	1	global
3	based	2	airport	1	glass	1	states	1	secondary	1	navigation
3	properties	2	projects	1	foam	1	ultraviolet	1	mortgage	1	satellite
3	value	2	model	1	wall	1	protective	1	finance	1	system
3	risk	2	climate	1	cladding	1	anti-microbial	1	interventions	1	gnss
3	analysis	2	change	1	insulation	1	antimicrobial	1	university	1	observation
2	gas	2	environmental	1	granite	1	zinc	1	cooperative	1	geodetic
2	burner	1	locally	1	dust	1	copper	1	societies	1	positioning
2	zirconia-based	1	sourced	1	organic	1	infused	1	commercial	1	cultural
2	nozzle	1	light	1	additives	1	vessels	1	investments	1	landscape
2	building	1	weight	1	corrosion	1	household	1	appropriateness	1	potentials
2	printing	1	micro-porous	1	resistant	1	point-of	1	valuation	1	low-energy
2	industry	1	bricks	1	ramming	1	use	1	used	1	strategies
2	effects	1	partitioning	1	mixes	1	water	1	art	1	offices
2	health	1	construction	1	lining	1	purification	1	works	1	adapting
2	quality	1	low-cost	1	fritting	1	yoruba	1	non-economic	1	indoor
2	contemporary	1	offset	1	furnaces	1	ceramics	1	facility	1	air
2	inter-relationship	1	lithography	1	kaolinites	1	white	1	services	1	naturally
2	gender	1	evaluating	1	characterization	1	ware	1	muritala	1	ventilated
2	stereotyping	1	praxis	1	bio	1	colour	1	muhammed	1	lecture
2	television	1	african	1	bone	1	illusoriness	1	lagos	1	theatres
2	culture	1	prints	1	substitute	1	raw	1	london	1	comparative
2	thermal	1	medical	1	uses	1	refractory	1	heathrow	1	walling
2	developing	1	electronic	1	tiles	1	composite	1	influence	1	tropical
2	towards	1	workflow	1	industries	1	practice	1	tenants	1	neighbourhood
2	eco-friendly	1	communication	1	environment	1	nigeria	1	personality	1	public
2	practices	1	academic	1	approach	1	studio	1	traits	1	space
1	city	1	security	1	infrastructure	1	supply	1	disasters	1	spaces
1	defensible	1	neighbourhoods	1	quest	1	estates	1	investigation	1	green
				1	energy	1	induced	1	challenges		

Table 2. List of words in 57 PhD titles surveyed showing their frequency of use (285 words).

The following word cloud delineates a pictorial view of the major methodological terms influencing research in the chosen case study.

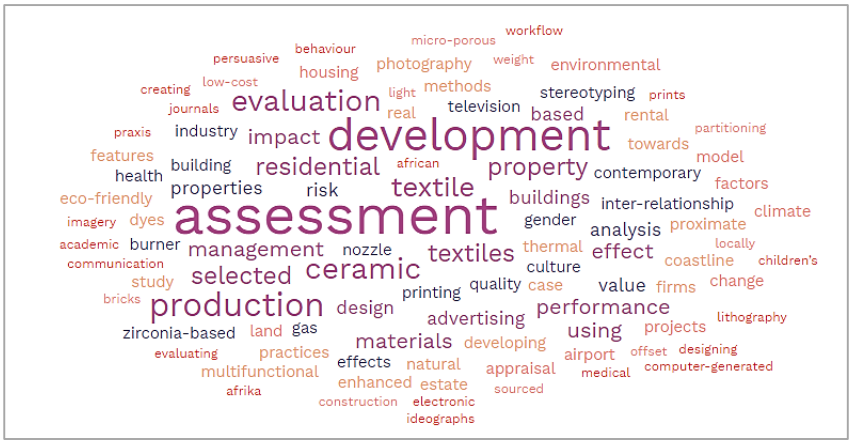

Figure. 1: Word cloud of PhD. titles generated mapping out frequency of action verbs, connoting researchers' methodological preference in study Area.
Source: https://www.freewordcloudgenerator.com

The action verbs in the selected titles were supposed to point to the kind of methodologies the researchers deployed, but most were not used in the context of design and development. So a cursory look at some of the titles were misleading. However, it is worthy to note here that though "development" seem a popular term highlighted in the cloud suggesting a high frequency of use, it was not mostly used in the context of practiced-led design and development. Examples are:

1. "Evaluation of Growth and Development in the …";
2. "Analysis of the non-economic factors in property development …";
3. Development of Risk Allocation Model …" and
4. "Development of Knowledge Management Maturity Model …"

The same goes with the term "production" which naturally should connote that some form of praxis will be a major activity during the research, but the following titles using the term production reveals otherwise:

1. "Evaluating design praxis in African prints production …";
2. "Assessment of the production and uses of …";
3. "Assessment of Eco-Friendly Textile Production Methods for Sustainable …" and
4. "Entrepreneurial Activities of Women in Cottage Textile Production …"

Furthermore, going through their reports revealed that a substantial number of these researches though in the Plastics Art and Design disciplines were majorly surveys relying on data from questionnaires that has no influence from practical action, observation and experience.

Figure. 2: Frequency Word cloud of preferred methodologies adopted by PhD researchers in study Area.
Source: https://www.freewordcloudgenerator.com

Thirty- seven out the fifty-seven (57) sampled PhD methodologies reviewed were underpinned by single research methods. Twenty-eight (28) of them were survey driven (positivist methodology). While nine (9) had a sprinkle of other methods (product-design, design-thinking, experimental, etc.). The twenty others were a medley of mixed-methods comprising of a combination of survey/experimental research, survey/product-design research, survey/design-thinking research, etc. They covered both quantitative and qualitative researches. A close look at the research studies reveals a culture of perennial use and astute knowledge of positivist research tools, but generally deficient in the epistemological (philosophical) aspects of research. In addition, majority of the researches also revealed a jaundiced knowledge of general qualitative research, particularly in the areas of methodology and axiology. Findings revealed that a lot of researchers in the Nigerian built-environmental landscape (using the sampled case study) have scant knowledge of the qualitative approaches to research, particularly the aspect of what instruments to use for data generation and analysis. Of the twenty (20) odd proposals that suggested that the researchers adopted mixed-method research approaches, eighteen (18) indicated they used the interview tool to generate data. However, none (0) showed evidence or suggested how they analysed the interviews they conducted. At the final count, about seventy-three percent (73%) of these researches were conducted predominantly with quantitative research methodologies.

Ideally, this paper should see as a welcome development the adoption of qualitative research methods in the built-environment, but that is not the case, even though global best practices have encouraged using several combinations of quantitative and qualitative methods for a while now (Creswell, 2011). However, outside advocating the adoption of qualitative methodologies for research in the built environment, there is a more involving and hands-on methodology taking the world by storm which should be of benefit to researchers who intend to do practice-based research. This third paradigm combines the attributes of both the quantitative and qualitative methods into an interesting mix (not mixed methodology) which some have christened 'Constructive' and others 'Performative' research methodologies respectively (Koskinen, Zimmerman, Binder, Redstrom, & Wensveen, 2011; Gray & Malins, 2004, 2003).

Practice-As Research

Historically, the (any) conduct of research activities overtime has been restricted to the use of quantitative research paradigms and later qualitative paradigms to create knowledge, as art and design practice areas were not considered intellectual fields that could participate in research. In other words, interested art and design practitioners who wanted to be involved in research practice were compelled to adopt the positivist or qualitative approach to reporting their findings. However, recent engagements by art and design practitioners in the academia have created a new paradigm to aid the articulation of creative art practice in a form that can be construed as research practice.

Arguing on the rationale on why there should be a separate paradigm distinctively different from the quantitative and qualitative ones we have known over time; Haseman in Barrett, & Bolt, (2011) posits that: "to understand the developments wrought by practitioner-researchers from the arts and design is to see them as part of the ongoing project to clarify the materials and methods of qualitative research.

After all, a number of qualitative researchers had made similar arguments in the past. Judy Norris acknowledges that:

> "…many were drawn to qualitative research as we came to realize how much life was squeezed out of human experience when we attempted to make sense of it in a numeric, non-contextual way" (Norris 1997: 89).

Constrained by the capacity of words to capture the nuances and subtleties of human behaviour, there has been a call by some scholars and researchers for 'texts that move beyond the purely representational and towards the presentational' (Denzin 2003: xi). This has resulted in proposals for qualitative researchers to use symbolic forms such as poetry, fiction writing, theatre, performance, dance, music and the visual and graphic arts to represent their claims to knowledge (Barrett, & Bolt, 2011).

Practice-led and practice-based are relatively new terminologies used to define research conduct or inquiry. The type of research in question is designed to incorporate or use practical skill activities or acumen in the process of creating knowledge. The method is meant to be at par with quantitative and qualitative research; it is most widely used by the art, architecture and design disciplines. However, besides the fact that research practice in art and design is relatively new, a lot of debate on it has already populated the academia. The most popular are: issues on nomenclature, definition, scope and what is construed as practice-led. To support Haseman is the defining description of what practice-led research entails from Bruce Archer (1995) in which he succinctly delineates a rationale for and the respective ways for 'doing' practice-led research:

> "There are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to attempt to construct something, or to enact something, calculated to explore, embody or test it", (Rust, Mottram, & Till, 2007).

Nonetheless, Christopher Frayling's political pamphlet seems to have set the stage, in his adaption of Herbert Read's model of education through art; in which he described the different ways of thinking about research, remarking that research could be FOR practice, where research aims are subservient to practice aims, THROUGH practice, where the practice serves a research purpose, or INTO practice, such as observing the working processes of others (Rust, *et al.*, 2007). Nevertheless, Archer and Frayling are in accord on the position that practice can only be said to have been employed in research if the method or methodology includes an explicit understanding of how the practice contributes to the inquiry, thereby making the research distinguishable from other forms of practice by that explicit understanding. Furthermore, Candy, (2006) insists that to qualify as a practice-led research activity; the process should involve a continual reflection upon the practice and on the resulting information of the practice.

Although the terms practice-led and practice-based have been used synonymously by a lot of practitioners, Nimkulrat, (2007) avers that they do not actually have the same definition. This has been widely debated over the years by art and design scholars but no clear conclusion has been reached (Frayling, 1993; Nimkulrat, 2007; Yee, 2010; Lawson, 2012). An instance is the debate on the definitions of both practice-based and practice-led as perceived by Frayling and Coumans' (Nimkulrat, 2007). Frayling argues that practice-based research is the advancement of knowledge partly by means of practice. This he further describes as an original/creative piece of work, distinct and significant as a researched endeavor, which must exhibit evidence of its originality, mastery and

contribution to the field that should be seen demonstrated through the original creative work. In conclusion, he reiterates that practice-based submissions must include a substantial contextualization of the creative work.

Within practice-led research it is the design process moving from problem to solution that is the point of departure for the rhetoric research direction of the thesis.

> "… The research direction of an artist/designer 'other than the art and design process' is a transparent process in which conscious steps are taken, in which knowledge is used, or knowledge is searched for and articulated in the process... The artist/designer, therefore, must also demonstrate that he [sic] possesses sufficient knowledge to justify the choices he [sic] has made" (Coumans, 2003, 62-67).

From the above definitions, Nimkulrat revealed that there are about two significant differences between practice-based and practice-led research undertakings. The first is on the nature of art/design practice; in which she averred that practice in practice-based research can be carried out freely for its own sake in order to produce artefacts; this is the commonly understood way in art/design practice. By contrast, practice in practice-led research is a conscious exploration with the knowledge involved in the making of artefacts. Secondly, she also reflected on the difference in the roles of a practitioner and researcher. In practice-based research, the practitioner's role may be more dominant than the researcher's role, here the emphasis seems to be placed on practice, as the practitioner-researcher carries out her research that is solely based on her own practice. In practice-led research, the two roles appear to be equally important, because research becomes an intertwined part of practice (Nimkulrat, 2007). However, the next item in contention is what methodologies and methods underpin the conduct of research in both practice-led and practice-based research.

Practice-Led Research Methodologies and Methods

Practice-led research inquiry according to Langrish in Candy, (2006) is conducted by the process of asking questions which are concerned with things that are visual, and methods used are not specific but mixed, ranging from quantitative, empirical methods to more qualitative, social science methods, and the evidence produced in response to the research questions can vary from a traditional big-book thesis to a portfolio containing design pieces that are accompanied by a shorter thesis. Surveys show that outside the act of practice as a key element in the process of research, there is no other specific method of inquiry which can be said to be unique to practice-led research. However, a look at various practice-led research projects reveal that, their respective methods of inquiry were influenced or determined by what problems and/or type of practice the practitioner is engaged in (Barrett, & Bolt, 2011; Gray & Malins, 2004; Koskinen *et al*., 2011). Nonetheless, what makes visual, performative, and media art-based research so distinctive are the ways in which the researchers conduct their enquiries beyond the sphere of written discourse. As earlier stated there are two competing methodologies seeking to dominate (stamp their feet on) the realm of creative practice research: that is the performative and the constructive approach respectively. While the performative by its nature champions the practice-led approach the constructive is predominantly practice-based.

In support of the argument for practice-led research; Haseman in (Barrett, & Bolt, 2011) is of the position that practice-led research cannot merely be subsumed under the qualitative research framework, but rather has its own distinctive research approach with its own strategies and methods, drawn from the long-standing and accepted working methods and practices of artists and practitioners across the arts and emerging creative disciplines. Haseman in conclusion, states that these distinctive qualities point towards an entirely new research paradigm, which he argues can be best understood as performative research. Performative research conduct has its own distinctive protocols, principles and validation procedures, which are expressed in non-numeric data, but in

forms of symbolic data other than words in discursive text. These include material forms of practice, of still and moving images, of music and sound, of live action and digital code. And its process of generating or creating knowledge is via a multi-method approach led by practice.

The term practice-based would most certainly have been influenced by Christopher Frayling's working paper (Frayling, 1993), which advocated for an empiricist and pragmatist approach to research conduct in the creative arts, advocating for the construction or making of prototypes, products, and models; to codify their own understanding of a particular situation, provide a concrete framing of the problem and a description of a proposed, preferred state. He further reiterated that designers should focus on the creation of artefacts through a process of disciplined imagination, because the artefacts they make both reveal and become embodiments of possible futures. Furthermore, that design researchers can also explore new materials and actively participate in intentionally constructing the future, in the form of disciplined imagination, instead of limiting their research to an analysis of the present and the past, (Koskinen *et al*., 2011).

The above mandate is what has evolved into the constructive design paradigm. Although many designers are certainly constructivists in a theoretical and philosophical sense. This paradigm should not be misconstrued with constructivism in which people like Vygotsky, (1978) claim that issues such as knowledge and society are constructed rather than, say, organized functionally around certain purposes, as if in a body or in a piece of machinery. "Constructive design research," refers to design research in which construction (be it product, system, space, or media) takes centre place and becomes the key means in constructing knowledge. Typically, this "thing" in the middle is a 'prototype' (Koskinen *et al.,* 2011, 5). A prototype as defined by the Encyclopedia Britannica, is "an original or first model of something from which other forms are copied or developed" (Britannica, 1993). This prototype (constructed thing) enables stakeholders get an idea of tangible things like mechanics, behaviour, materials and colours, through which they can practically understand, touch, materials and shapes.

The Ting (prototype)

The Scandinavian concept: of a 'ting' is comparable to the 'watering hole' "an assembly". However, while the former is a place people meet to make decisions on the future of a community, the later allows all humans and nonhumans converge to share provisions, and create knowledge (learning e.g. Actor Network Theory - ANT). Furthermore, Julius Nyerere's concept of the *Ujamaa* (African Socialism) and "villagisation" would also find a place amongst the duo, especially where his ideology preached the ethos of 'work together, and help each other, which was a blue print for economic cooperation in Tanzania (Papanek, 1985; Ibhawoh, & Dibua, 2003). In an attempt to compare the above with design, Ehn in Koskinen, *et al.*, (2011) opine that, design things are like town hall meetings; they are places where people gather to decide collectively where to go, and that design things are also indispensable tools for transforming designers' intuitions, hunches, and small discoveries into something that stays, for instance, a prototype, product, or system. The fora these design 'things' create, most times become boundless avenues for data collection, which in this case will be through observation and interviews. Thus the praxis and self-reflexivity involved in the creation of the artefact (prototype) supported by the interaction/interventions amongst conveners would evolve a more broad-based knowledge creation process. Constructive Design inspired methodologies include experience prototypes, design games, and many types of traditional design tools such as collages, mood boards, storyboards, pastiche scenarios, "personas," and various types of role-plays. Other methodologies adopted are cultural probes, make tools, and action research.

Reflexivity

A major attribute of practice as research is the researcher's self-reflexivity endeavours in the process in which her/his research is conducted. Donald Schön in Koskinen, *et al.*, (2011) defines design as a reflective dialog between designers and their materials. The exploration of knowledge partly through

making artefacts according to Makela, & Nimkulrat, (2011) has brought a new dimension to design research as the practitioner researcher not only creates an artefact but also documents, contextualizes and interprets the artefacts as well as the process of making them. This way of creation allows practitioners to elicit reflection in and on their working processes which Schön (1991) suggests can be considered new knowledge gained in action. And this knowing in action, he further reiterates would ordinarily be in tacit form and implicit in our actions. Scrivener (2000) in Makela, & Nimkulrat, (2011) reflection in practice plays a crucial role as it supports the practitioner's reflections and brings greater objectivity or critical subjectivity to the whole project. In addition, praxical knowledge according to Barrett, & Bolt, (2011) involve a reflexive knowing that imbricates and follows on from handling and that reflexivity in such research involves not only a focus on the validation of data and outcomes, but also the positioning of one's self in relation to other fields in order to reveal the character and sources of one's interest. In conclusion, Gray & Malins, (2004) consider reflexivity as the act of turning back of one's experience upon oneself, which they believe creates the capacity for self-evaluation and self-improvement through rigorous and systematic research and study of one's own practice'.

Conclusion

All practice related researches have certain common denominators, which is that they are hinged on the respective praxis of the practitioners' discipline, the reflexivity brought to bear in the process of creation or service, the output of their endeavours and the community of discourse created in the process of sense making (knowledge, communication, interaction, usability, replicability, etc.) These methods would undoubtedly adhere to the iterative protocol of problem solving in design technology (Kolb, 1984), and would support research activities that bring about research collaboration, co-creation, and co-production. A cursory look suggests some members of the case study have been involved in practice related research in the past. The question however is: "Have their researches been practice-based or practice-led?" "Have they been adhering to the methodologies inherent?"

In conclusion, the author is of the opinion that both constructive and performative research paradigms will conveniently underpin researchers who adopt practice-led research projects, as such will involve the creation of things, models and or service provision. Secondly, such researches will be more concerned with activities and concepts like: "design, development, fabrication, and construction, etc." From the axiological perspective, the author believes that adherence to the adoption of more practice-based methodologies will improve practical oriented research activities amongst researchers. There will be an increase in researchers' tacit knowledge of the "doing" in practice. In addition, such projects will be more tangible output from postgraduate research projects conducted in the built environment, particularly in the selected case study.

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