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CHALLENGES OF RESEARCH METHODOLOGY IN PRACTICES AND THE EPISTEMIC NOTION OF MIXED METHODS IN THE ACADEMIA

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ABSTRACT: *This article explains the foundation of knowledge acquisition through discourses involving research methodology and research methods; differences between the two concepts is exemplified, with the former (research methodology) addressing philosophical underpinnings around the process of research, and through which human epistemic quest for knowledge is addressed, while the latter (research methods) addresses problems involving the application of qualitative or quantitative techniques (in some cases mixed-methods) in answering the researchers' underpinning research questions / hypothetical postulations. Challenges surrounding research ethics is relevantly addressed with a view of explaining issues needed in ensuring research processes are successfully accomplished through 'detailed eye for issues', for example, the application of skills needed to access research participants without inflicting harm unethically.*

KEYWORDS: Research Methodology; Research Methods; Mixed Methods; Epistemology; Ontology; Ethics

INTRODUCTION

All research processes, whether on laboratory experimentation or explanations based on the observation of animate objects (mostly human beings) in their (social) environment, involve the pursuance of knowledge acquisition aimed at expanding human understanding of existentiality; that which makes it possible to understand the rationality of human beings with regard to their (economic) choices, and with possible actions taken to resolve on-going problems. Methodology itself is philosophy, not necessarily pursued in totality by one person or in a single discipline as it consists of many components; what Herman (n/d) illustrated in his work as the:

> *'study of human behaviour, structural and functional modalities require to be translated into the brain-mind characteristics and properties - he went further to explain the fact that, in an attempt to understanding the (human) mental constructs, we use the **nominalists** and **realists**, thereby taking different postures in assigning reality and potentiality to these intangible realities.*

Philosophical inquiries through methodology involve a lot of things, and particularly when it concerned the exploration of complex concepts, such as that which is responsible for the 'hidden ethical (un)justly behaviour of mankind towards the other, for example. The word philosophy carries different meaning, and with varying definitions, mostly based on the perspective from which a person's arguments are to be focused. In exploring the methodological base of the study, reference is hereby drawn to Herman's (n/d) definition of philosophy which is stated thus:

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> "*Philosophy consists in learning the background realities that account for what we can know, or think we can know, chiefly by developing and applying methodologies by which to better ask the right questions and seek the simpler threads within and among complexities that are not otherwise readily accessible to the unaided mind*".

The study of concepts involving methodology is not that straightforward; it involves setting the mind to ask the right questions in order to arrive at answers, and this in all cases will incorporate the use of specific techniques, mostly dealt with in the academia by students pursuing research oriented courses or modules, for example, research proposal, dissertation and thesis.

If philosophy entail the process of engagement with epistemological and ontological concepts, and for which methodological inquiry is needed through the application of different techniques, then what is an acceptable definition of the word Methodology? - at this juncture, I will draw attention to Herman's (n/d) definition which is stated as:

> "*(usually) conceptual structure that, both because coherent and internally consistent, and because comprised of a template of putative and/or accepted principle, is employed to analyze and/or organize data from which to discern or reasonably impute a common core principle within the analysis that may enable either the development or logical validation of theoretical postulates*".

All research work, whether for academic pursuance or practice-based application, involve an interplay between two concepts, that is, *methodology and philosophy*; very challenging areas to explore as many a time, the concepts are narrowly dealt with in the academia, and to some degree of depth by graduate researchers pursuing philosophy-related studies, for example, M.Res, MPhil, Doctorates, and for which evidence is required to demonstrate the obvious possibility of '*contribution made to new discipline of knowledge*', possibly through methodological / theoretical postulate or result outcomes, emanating from the application of specific research techniques / methods.

Rationale and Objectives of the Study

This article is intended to unravel difficulties associated with poor performances of research work produced mostly in the academia, more so by students in their final year of undergraduate studies, and also at postgraduate level (masters and doctorates). As outlined by Herman (n/d), the lack of substantive tuition around the subject area of philosophical underpinnings of methodology is an attestation of the low quality of research work produced by students (mostly at graduate level); insufficient time is embedded into the provision of knowledge acquisition pertaining to the subject matter at undergraduate level, and the situation is also true for graduates of typical philosophy courses, whose application of methodological concepts seemed almost equally terrible. Therefore, this article is intended to explore the '*ontological and epistemological* (reference to Jackson, 2016a)' base of the interconnectedness and distinguishing features between the concepts of (research) ***methodology and methods***, and more so, that which explore researchers' understanding of ***mixed methods*** philosophy (rooted on the paradigm of ***Methodological Triangulation***).

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Equally, ethical dilemmas on what constitute good or bad practices during research will also be brought to the fore, in a bid to unravelling areas of concern pertaining to the academic pursuance of the epistemic quest for knowledge exploration (whether in the social or physical sciences). It is a common practice within the academia in some countries, particularly in the UK for research work concerning involvement with animate objects (mostly mammalians) to seek approval from an ethics committee in order for such research to be granted the 'go-ahead'. It is worth noting that the underlying basis of methodological enquiry leading to the epistemic quest for knowledge must incorporate aspects of ethics; that which exemplify virtuous actions of the researcher on how data were or is to be collected from participants (detailing specifics about ethical consents and approval from participating communities). On the basis of this explanation, the main objectives are stated thus:

- *To advance an explanation of differences between research methodology and research methods.*
- *To explore the relevance of ethical considerations to research processes in general and concerns.*

RESEARCH METHODOLOGY / RESEARCH METHODS AND DISTINGUISHING FEATURES

The concepts of research methodology and methods are very critical to the epistemic exploration of what in the future may contribute to new discipline of knowledge, particularly in the academia. It is very rare for research undertakings at undergraduate studies to provide details involving clear-cut distinctions between (research) methodology and methods (Herman, n/d). Indeed, there are differences between the two concepts, but not necessarily '*mutually exclusive*', as the process involved in the exploration of knowledge (methodological concepts) through the advancement of specific research questions or hypothetical statements, is surely going to require specifics of techniques the researcher would use in order to arrive at some conclusive outcomes.

Methodology as a concept is underpinned by the need to seek for the pursuance of knowledge acquisition. Philosophically rooted, it seemed a rather 'dry / un-interesting' area of concern by researchers, but its usage is very paramount in explaining the process of how knowledge is to be pursued, regardless of whether undertaken in the pure or social sciences discipline. For a research to be successful, it is worthwhile for the researcher, particularly in the academia to plan the work so as to be more specific about the direction on which the concept of methodology is to be explored; for the intending researcher seeking to make use of '*mixed methods*', it is very important for concepts around '***methodological triangulation***' to be explored, and linked directly to the relevance of the justified methods for the study at hand. Methodology as a concept is very important, not only as a means of exploring specialist thoughts, and the effectuation of external validation, but more so in understanding the pathway through which knowledge can be pursued; as Charles Sanders Pierce (1878) expressed it: '*you need to get into their head in order to properly comprehend their thought*'.

There are varied methodological concepts available to intuitively challenge the researchers' direction of knowledge exploration, and in their choices of methods to commence data collection as illustrated in Table 1 below (Clarke, 2005).

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Table 1: Research Methodologies

Methodologies	Description
Hermeneutics	Historically linked to studies relating to biblical exegesis and the legal profession.
Phronesis	Based on the Greek philosophy of virtuous actions of mankind - viewed as both intellectual and ethical on the grounds of what is considered good or bad.
Historical	This relates to the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and arrive at conclusions about events in the past. Philosophical thoughts emanating from such epistemic inquiry will involve such questions as: - where the event took place? - Who were involved? - When the event took place? - What kind of human activities was involved?
Comparative	This in most cases can be used with historical research to compare people's experiences of different societies, most probably in the past and parallel with the present (at both micro and macro levels).
Descriptive	This type of research relies on observation as a means of collecting data. This can apply research methods techniques like interviews, questionnaires and selective observation of events.
Correlational	This is a quantitative research, and it describes the statistical measures of association or relationships between two phenomena (can determine relationships, and also attempts to predict behaviour.
Experimental	This is a type of research that seeks to isolate and control every relevant conditions that determines event investigated in order to observe the effects when conditions are manipulated. This include different types, for example, 'Pre-experimental, True experimental, Quasi-experimental and Correlational / post-facto.
Evaluation	This describe types of research designated to deal with complex social issues. Its outcomes are mostly dealt with critically in order to provide weighted balance on the study of concepts.
Action	This has some similarity with experimental research, but done in the real world - it is a type of intervention that is carried out on the spot, and constantly seeks to monitor and evaluate and provide conclusion, and hence considered as a form of exploratory research.

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Ethnogenic	In this, the researcher is interested in hoe subjects of the research theorist about their own behaviour rather than imposing a theory from outside. It has several aims to the epistemic exploration of knowledge, and an example of it is 'that it attempts to represent the totality of the social, cultural and economic situations, regarding the context to be equally important as the action.
Feminist	This type of research is considered modern as it has no single set of methodologies - rather a related set of practices which start from a position on research which says that gender and issues of identity politics must be considered as an enormously influential category in social theory.
Cultural	This is a form of postmodern / post-structuralist type of research predominantly concerned with language and cultural interpretation, and for which issues emanating are considered central to sociological studies. This seeks to apply three approached, particularly in the interpretation of texts: - contents analysis: a type of positivist of attempt in identifying subjective meaning in the cultural domain. - Semiotics: this attempts to gain a deep understanding of meanings through the interpretation of single element of texts and in return 'tracing the meanings of things back through the systems and codes on which they have meanings (Slater, 1995: 240). - Discourse analysis: this study way that people communicate within social settings.
Triangulation	This is a form of enquiry that allows concepts to be mixed. Denzin (2006) postulated four different types: - *Methodological* (a focus of this study), and encourages mixture of two or more methods (qualitative and quantitative, for example) in a single study. - *Theoretical*: this makes use of more than one theory in the process of interpreting phenomenon. - *Data*: this is supposed to involve a lot of things, for example, time, space and people. - *Investigator*: this requires the involvement of many researchers in an investigation of concepts.
Sources: Clarke, 2005, Jackson, 2016b and Jackson and Conteh, forthcoming	

More specifically, the concept of methodological triangulation, sets the way through which justifications can be explained, based on the need to apply ***mixed methods*** in a research. As explained in Bekhet and Zauszniewski (2012), methodological triangulation or mixed-methods research uses more than one kind of method (or theoretical concepts) to study a phenomenon (Risjord et al 2001, Casey and Murphy 2009); there are basically two types, namely '*across method*' and '*within method*' - the former combine quantitative and qualitative data-collection techniques, while the latter (within-methods) studies use two or more data- collection procedures, quantitative or qualitative, but not both. This type of approach increases the scope

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for the validity of research outcomes, through reduced chances of weaknesses associated with the use of a single method.

According to (Clarke, 2005), the process of researching concept can be conceptualised into models / paradigm (Cresswell, 2003), namely:

- *quantitative*: also generally referred to as traditional, positivist, experimental, or empiricist (supported by scholars like Miles and Huberman).
- *Qualitative*: based on constructivist, naturalistic, interpretive, post positivist or postmodern perspectives as advanced by scholars like Miles and Hubetman.

The above models / paradigms (also capable of being carried out through primary or secondary means) can be philosophically linked to the under-mentioned research assumptions.

Table 2: Research Assumptions based on the Notion of Qualitative and Quantitative Paradigms

Assumption	Question	Quantitative	Qualitative
Ontological	What is the nature of reality?	Reality is objective and singular, apart from the researcher.	Reality is subjective and multiple as seen by participants in a study.
Epistemological	What is the relationship of the researcher to the researched?	What is the relationship of the researcher to that being researched?	Researcher interact with that being researched.
Axiological	What is the role of values?	Value-free and unbiased.	Value-laden and biased.
Rhetorical	What is the language of research?	Formal, biased on set definitions, impersonal voices, use of accepted quantitative words.	Informal, evolving decisions, personal voice, accepted qualitative words.
Methodological	What is the process of research?	Deductive process; Cause and effect; Static research design - categories isolated before study; Context-free (independent); generalisations leading to predictions, explanation, and understanding; accurate and validity and reliability (testing).	Inductive process; Mutual simultaneous shaping of factors; Emerging design-categories identified during research process; Context-bound; Patterns and theories developed for understanding; accurate and reliable through verification.

Source: Clarke, 2005).

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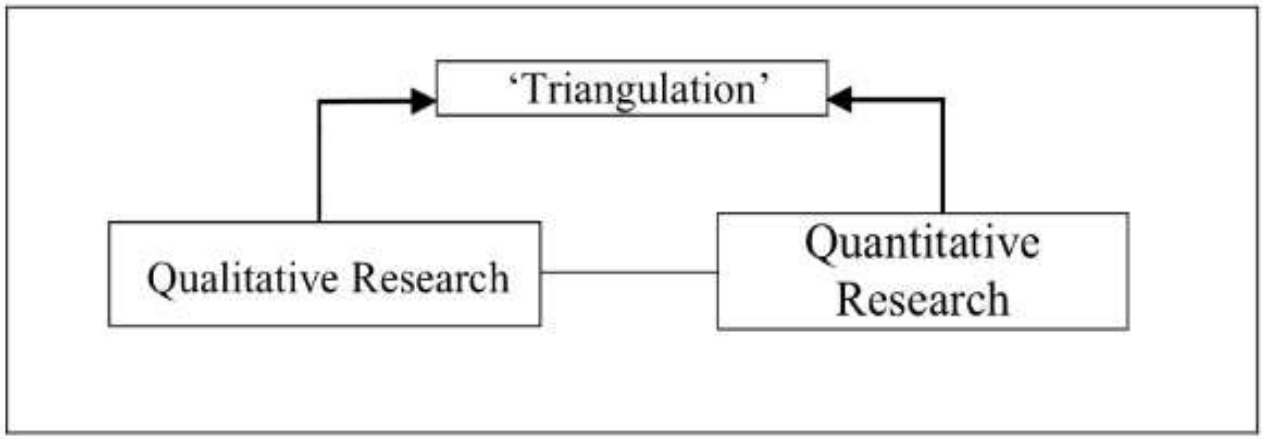
Interpretation of the above (Table 2) research models varies, more so on the basis of whether it is pursued in the physical sciences (where meanings can be interpreted with precision, mostly through experimentation), or in the social sciences (where concepts or models can be explained on the basis of opinions, values, traditions and cultures, Clarke: 2005).

Triangulation of mixed-methods approach is also exemplified in Diagram 1 below, and for which Yeasmin and Rahman (2012: 156) confirmed as a way of enhancing validity of research outcomes in the study of same phenomenon; metaphorically related to a process in disciplines like Mathematics (trigonometry), where the investigator gets a fix on the position by carrying out three measurements to determine the exact position of a point in a plane.

Diagram 1: Triangulation Concept



Source: Yeasmin and Rahman, 2012

Research Methods on the other hand addresses techniques through which the epistemic quest for knowledge is explored; this may be pursued through quantitative or qualitative means (and in some cases, triangulating both approaches), and supported by the use of analytical tools (see relevant section on '*analytical approach to research*'). As exemplified by MacDonald and Headlam, n/d, research methods are the tools used to explain social phenomena. With the researcher being more conversant with the variety of methodological tools, it can be made possible for challenges to be advanced on conclusive evidences. Research methods specify clearly how the research process is to be carried out, for example whether secondary or primary data, and also with consideration on either qualitative or quantitative, and in some cases mixture of methods (triangulation). The section on methodology would have already set out the problem of investigation (in this situation, helping out in terms of theorising on set research questions or hypothetical statements) from which the chosen method(s) will assist in guiding the process of gathering relevant and sufficient data to help the researcher arrive at definitive answers. Depending on the researcher's choice, there is all possibility for consideration to be given to any of the under-mentioned research techniques / methods.

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Table 3: Outline of Research Methods		
Research Technique	**Type**	**How / Source**
Quantitative Method	Survey / Questionnaire, Experimental design, Econometric, etc.	This can be sought through primary and secondary means.
Qualitative Method	Interviews (mostly focused group), Participant observation	Mostly primary, but can also be sought through secondary means as in the case with textural and ethnographic study.
Mixed Methods	Combination of any of the above in a single study (both secondary and primary)	Mostly sought through primary and secondary means to increase validly of outcomes.
Developed by author		

Once techniques are identified, the research process will then continue with the researcher identifying specifics of planning the process, for example, this may include preparing set questions in the event that a quantitative survey method is to be used. The researcher will have to ensure that questions are relevant in addressing the underpinning research question(s) or hypothetical statements. Similarly, in the case of a qualitative research technique, the researcher will need to plan the relevant questions to ask, place and time of interviews. The environment (ethical concerns to be addressed later) must be conducive enough to enable concepts to be extracted from the research.

For mixed methods research approach (comprising of mixing two or more qualitative / quantitative methods or a mixture of one of each methods), the real challenge is to ensure techniques used are sufficiently appropriate so as to make it possible for validity to be addressed. Mixed methods approach to research is particularly considered good, but needs proper planning so that the researcher is able to sufficiently address the proposed research questions. In addition to the need for improving validity, reliability is also a very important aspect when mixed methods are used in a research (Zohrabi, 2013: 259 - 260); in a situation where both qualitative and quantitative methods are applied (*across methods concept*), there is a higher prospect of producing complex knowledge necessary to inform theory and practice (South Alabama, n/d).

Greater part of the challenges of using mixed methods in the pursuit of methodological enquiry is to do with the high level of skills required to mix both qualitative and quantitative methods, and hence, this may not be easily accomplished by one research as it is considered expensive and time consuming. In this vein, some methodological purist has contended that research professionals should always endeavour to work within either a qualitative or a quantitative paradigm (South Alabama, n/d, Kern, 2016: 14 and Denzin, 1978). Therefore, the skill of

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research methodologist is quite in high demand when thinking about the need to mixed methods, given complexities associated with the application of relevant theoretical underpinnings, and the analytical aspects of data essential to ensure hypothetical postulates / research questions are answered well.

Ethical Challenged of Mixed Methods in the Academia

The real challenge of research (particularly enabling research questions to be addressed sufficiently) is to do with ethical concerns (Kit Tisdale, 2004). The research process has to be sufficiently transparent, with participants incorporated into the procedures so as to encourage their full participation. Ethics is considered to be that part of research which allows someone to express virtuous actions; that side of human action which enables the manifestation of '*good or bad*' virtues towards those whom they seek to obtain information (Crisp, 2015), and what Gadamer referred to as phronetic values (2015). In this case, retrieval of information from research participants must be sufficiently planned so as to ensure consent is obtained, and with approval from participants about the nature of information to be obtained. A good research, particularly where information is sought through consent from participants, is one that is adequately able to negotiate access with the research community. As explained by Jameton (1984), also cited in Fouka1 and Mantzorou (2011: 7), it is declared that the three most important elements of a research should incorporate the following: *'competency of the researcher, careful design, and the worthwhile expected outcomes*'.

Trust is an essential element of ethical principles governing access to information from research participants, especially in the case with qualitative interviews (focused group and participant observation); this will make it possible for participants to reveal sensitive information, but only on the assurance that their anonymity is kept secret or confidential (Jackson and Conteh, forthcoming). In the academia, ethics is considered paramount, particularly so in ensuring reputation of institutions is maintained to the highest degree. Therefore, research processes in the academia will normally follow strict procedures, with an ethics committee set up to endorse approval of research procedures, more so in the collection of data from human participants and other living organisms.

At the University of Birmingham (UoB, 2015) for example, there is a high standard required for all research work carried out at the university or in the name of the university; there is high demand on researchers to declare their role in a research process, and with the need for accountability to be expressed to those whom they seek to obtain information from. In this vein, universities across the globe, and in particular UoB, ensures that intellectual property right is treated highly, and in this vein, information sought from participants must be vetted strongly in order to ensure their publication in the media (journals or books) do not result in disrepute to the university. In the case of research conducted by students, an ethics committee is normally set out to assess the manner in which information is to be collected; many a time, outcomes can either be an ***approval or disapproval*** of the process, in the event of a breach of ethical code of practice for the latter.

Analytical Approaches to Research

Methodological approaches to mixed methods philosophy can be made much easier with the application of modern technology; this can be done using technologies such as Nvivo (a qualitative tool) and SPSS (quantitative tool) applications. These are intuitively sound

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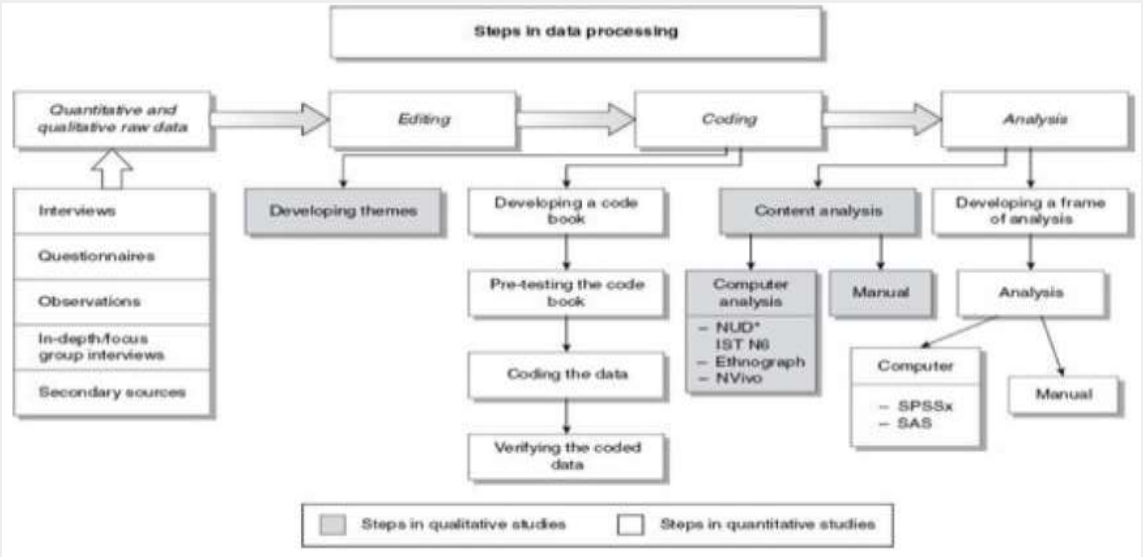
applications that allows the interpretation of concepts to be made ready for critical analysis / discourses, and eventually resulting in the epistemic theorisation of concepts.

Analysis of research data, particularly that which require the use of modern technology application needs sufficient skills set; methodological underpinnings of the research (in this vein, research questions or hypothetical statements) can be thoroughly explored when the researcher or data analyst fully explore the data provided. Diagram 2 below provides an illustration of a typical processing steps (Kumar, 2011).

Diagram 2: Data Analysis



Source: Kumar, 2011

For example, qualitative data analysis using application like Nvivo requires the categorisation of data into themes, thereby, making it possible for data retrieved to truly reflect the expected outcomes of the researchers' proposed hypothesis / research questions, except in the case with ***grounded theory*** research where theoretical constructs are generated from results produced. In a likewise manner, quantitative analysis of data with application like SPSS and MatLab (with Dynare and IRIS) can be made easy, but needs a great deal of expertise and knowledge to ensure meaningful information are outputted. As explained by Gorard (2011), quantitative analysis can be made easy when specialist applications are used, but results produced are sometimes not necessarily relevant to the work at hand, and hence, may not allow the pursued questions or hypothetical statements to be fully addressed in the final outcome.

Many a time, inadequate planning of data analysis, and even with the most sophisticated computerised application can pose serious challenge to the *validity and reliability* of outcomes, and hence, render the entire research process meaningless. With reference to diagram 2, an experienced data analyst (well-grounded in handling relevant information technology applications, for example SPSS / MatLab and Nvivo), would obviously add great value to the

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richness of the overall outcome of research undertakings as the thematic categorisation of data (qualitative) for example, will obviously lead to a process of allowing research questions and hypothetical statements to be pursued adequately.

CONCLUSION

The article has enabled concepts on *research methodology* and *research methods* to be explored in a bid to differentiating their role in research process(es). As already explained, research methodology concept is akin to philosophy, but more specific in the sense that its use is strongly attributed to that which allows human epistemic quest for knowledge to be pursued, through the exploration of specific research techniques (qualitative or quantitative, and in some cases mixture of both, normally referred to as mixed methods / triangulation).

The philosophical element of research methodology meant that the issue of ethical consideration cannot be avoided, particularly with the collection of sensitive data using any of the aforementioned research techniques. The process of ethical consideration is treated with high degree of importance in the academia, particularly so in developed economies like the UK where committees are normally set up to review research processes with the ultimate aim of making decisions on whether a particular cause of research action needs to be carried out, or rejected on the grounds of ethical concerns, for example, poor planning and insufficient evidence of consent to justify transparency of results. In conclusion, it is worth noting that both research methodology and research methods concepts are integral part of the journey towards the ontological and epistemological quest for knowledge acquisition, whether pursued in the pure or social sciences disciplines. In this vein, it is normally left with researchers to manifest phronetic virtues (normally, the utmost manifestation of good characters, with transparency to the participating communities) in their pursuit of knowledge exploration so as to make it possible for the desired epistemic exploration to result in something positive that will certainly add value to human understanding. There is also future possibility of test verification to confirm authenticity of the ascertained theoretical postulation(s) – this will assist in proving Popper's test of falsification (Popper, 1962, and also in Jackson, 2016c).

Disclaimer

Views expressed in this article are those of the author and do not reflect the named affiliated institutions mentioned.

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