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Research Methods and Methodology

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ABSTRACT

Research is an interesting field of study which every student or scholar has to encounter in the course of time. The objective of this paper is to explore the various approaches to research so that students can gain insight and understanding. This paper attempts a review of the various approaches to research so that the reader can make an informed choice. The paper is based on secondary sources plus the author's own experience borne from decades of teaching. This paper does not claim to have exhausted the list of approaches to research as there are far many approaches than can be dealt with in a short review communication. However, it is hoped it will lay a foundation for further research into the field by readers.

Key Words: research methods, research methodology, paradigm, research approaches

INTRODUCTION

Types of Research and Paradigms

Research is a process of investigation or a journey of discovery, moving from the known to the realm of the unknown in order to establish the truth or to prove a phenomenon valid or invalid, or to enable serious scrutiny of something which has been conjectured or surmised as an unproven idea in the form of a proposition, assumption hypothesis, or an adumbration or intimation of something which is vague in outline. In academics, research can take many forms such as pure theoretical research, applied research, exploratory or grounded research, explanatory research, quantitative research, qualitative research, empirical research, desk research, field research, and mixed research or triangulation, among many other methods of research (Bhattacherjee, 2012, pp. 5-8) Thompson and Walker (2010, p.47) aver that research involves eclectic and multidisciplinary approaches because of convergence of knowledge, practicality of research, overarching of knowledge, and the need to be reflective.

Greener (2008, p.10) writes to warn students that there is a difference between research methods and research methodology. She states that research methods is about data collection instruments such as questionnaires, interviews, and focus group discussions while research methodology is about research perspectives, approaches, beliefs and

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philosophies. The latter pertains to this paper with regard to methods of approaches to research and research paradigms.

Cohen *et al.*(2007) provide a model of the paradigms based on the work of Burrell & Morgan (1979) as follows:

No.		Subjectivist View	Objevtivist View
1	Nominalism	Ontology	Realism
2	Anti-positivism	Epistemology	Positivism
3	Voluntarism	Human nature	Determinism
4	Idiographic	Methodology	Nomothetic

(Source: Cohen *et al.*2007, p. 10)

These approaches in the model show the evolution of research approaches based on human-centred emotionalism and idealism, to objective detachment and removal of sentimentalism from the research equation.

A paradigm is a pattern or broad approach or perspective taken towards a method of research or study. This paradigm is informed by belief systems, philosophy, efficiency, effectiveness, economy, and above all intellectual persuasion of an academic institution or the idiosyncrasies and preferences of a research supervisor. Bertrand Russell came up with his Venn Diagrams in mathematics, and this created a new paradigm in research as it enabled researchers to explore relationships between and among objects in a cause and effect relationship, enriching understanding (cimt.org.uk)

According to Bhattacherjee (2012, p.1) ordinary research is carried out continuously on a daily basis by everybody in the form of making decisions concerning daily living as consumers research the best sites online to shop, the best tourist destinations to go to, among other things to ponder and make decisions on through research. Firms carry out surveys of customers and market research to deepen their knowledge of market trends, consumer buying behaviour and what competitors are doing. Journalists carry out Gallup Polls and opinion polls to inform the public and government about what the public interest is.

However, Bhattacherjee (2012) states that all these are ordinary research. Academic research on the other hand is scientific research which follows the scientific method and also follows rigid structures, strictures and methodologies which make their results valid, internally and externally validated, generalizable, parsimonious, consistent, replicable, and above all, fulfil rigorous academic standards and tests (Bhattacherjee., 2012, pp. 6-8)

Walliman (2011, p.2-3) states that in this age of Big Data and information overflow, research is cardinal in order to understand human events and to interpret the world events and phenomena correctly for people to gain insight and understanding of causes and effects.

Saunders *et al.* (2010, p.13) list research paradigms or philosophies as being made up of the following: positivism, realism, interpretivism, objectivism, subjectivism, pragmatism, constructivism, de-constructivism, functionalism, radical humanism, and radical structuralist approaches. They advise the student to start thinking of their own

value/factual approach to their own research. However, to Macdonald and Headlam (2011), research pans out into a bi-modal approach of quantitative and qualitative research which is the practical approach for many researchers in consultancy such as their group called CLES (Council of Local Economic Surveys)

DISCUSSION

The Scientific Method

The scientific method of research had its origins far back in history. The Greek philosophers Aristotle, Socrates, and Plato put forward the idea that to study phenomena you need to classify items into classes or identical groups with similar characteristics and you need logical reasoning based on solid premises. That was the beginning of rationalism (Bhattacherjee, 2012, pp. 6-7). Euclid the geometer also compiled ways of consistently arriving at mathematical proofs to avoid falsehoods. The ancient philosophers came up with many logical and rational methods of arriving at valid conclusions.

Then in the 16th century, Francis Bacon of Britain came up with the origins of the scientific method. His ideas coincided with those of Galiliel Galileo, Copernicus, and Johann Kepler who had disputed the geocentric views or postulates of the Catholic Church, and through mathematical proofs and astronomical observations with the newly invented telescope, they had put forward the heliocentric view as being correct. Isaac Newton later confirmed their views by his Laws of Motions. The person who properly formulated and consolidated the scientific method was Thomas Kuhn, an American scientist and philosopher (plato.stanford.edu)

The scientific method starts by having two assumptions of Null and Alternate Hypotheses which are opposing assumptions held before a research is carried out. Data is then collected on the variables of interest in a systematic manner through meticulous measurements. Before then, the independent and dependent variables are noted so that the research will be able to establish causality between them. If the results obtained show causality, then the experiment can be repeated in different places and time periods under the same experimental conditions and assumptions. If the experiments replicated and carried out in time and space, are the same, then a theory or principle has been established and the results can be disseminated in scientific publications or journals (sciencebuddies.org)

Figure 1 below illustrates the meticulous and robust steps and procedures involved in the scientific method. In the Social Sciences, such steps may be superfluous and unsuitable since humans are volatile, capricious, mercurial, unpredictable, and kaleidoscopic. The social sciences tend to let their objects of study speak for themselves and to interpret phenomena in line with Bandura's social learning approach. In that way, the researcher is detached and he does not influence or cause bias in research outcomes.

1. Make an observation.
2. Put forward a question based on earlier observation made.
3. Formulate a hypothesis, or testable explanation.
4. Put forward a prediction based on the hypothesis.
5. Test the prediction.

6. Repeat the experiment: utilize the results to formulate a new hypotheses or prediction.

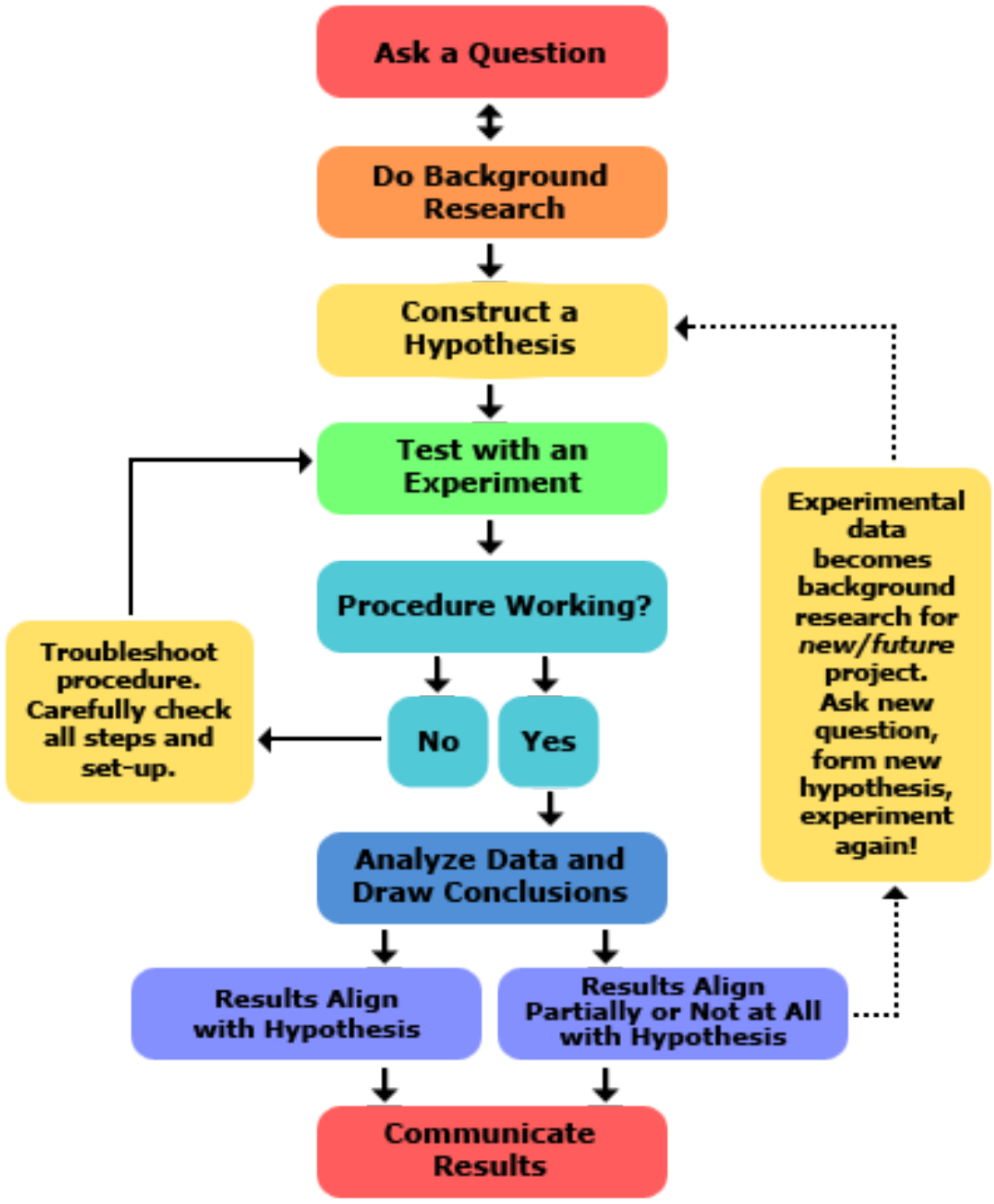

Figure 1: The process of the Scientific Method

Source: http://www.sciencebuddies.org/science-fair-projects/project_scientific_method.shtml

The scientific method is used in all sciences—including chemistry, physics, geology, and psychology. Lugwig Wittgenstein and Feyerabend were instrumental in inspiring and working with Thomas Kuhn on his Scientific Method (plato.stanford.edu) (khanacademy.org)

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Three Types of Research

There are many types of research but the three which this writer will focus on are Exploratory Research, Descriptive Research, and Explanatory Research (Bhattacherjee, 2012, pp.5-7)

Exploratory Research

Exploratory Research is conducted where the scope of the research is not known and the topic of research is a fertile area which was discovered as literature gap. Exploratory Research is also known as Grounded Theory and it is applicable in most Social Sciences and the Humanities where some phenomena are not deterministic. For example, a student may research on a topic such as:

4. 'ICT innovations such as the smart phone and the laptop computer have made students academically lazy and dull'

With such a topic researched on, it will yield different results for different countries and even within the same country, results will differ for different regions, different categories of students in different social groups, among others. Exploratory research may yield some insights for further wide-scale research. It may yield insights on the feasibility for further research, and the scope of a phenomenon or behaviour based on initial findings. Kothari (2007, p. xvi) suggests that Exploratory Research is to help develop a hypothesis and not to prove one. Exploratory research is based on educated guesses or hunches.

Descriptive Research

Descriptive Research is where a lot of data is collected on variables and measured to arrive at causal relationships. This approach uses the quantitative method whereby statistical and mathematical methods of research are emphasised. It shows the scientific method in action. Descriptive research examines issues of what, where, and when (Kothari, 2007). An example of a topic for Descriptive Research will be:

5. 'Increasing tax rates will reduce investment and therefore negatively affect economic growth opportunities in the economy'

Such a research will involve administering a lot of questionnaires and interviews to many randomly selected respondents and carrying out econometric tests such as autocorrelation, multiple regression analysis, sampling error tests, and confidence interval tests, among others (Bhattacherjee, 2012, pp. 6-8)

Explanatory Research

incorporates cause and effect analysis and according to Bhattacherjee (2012), this is normally the case with doctorate research where the topic of research is highly focused to yield room for originality and in-depth analysis by paying attention to issues of why and how. An example of an explanatory research will be:

6. 'Constitutional lapses cause local governments to be inefficient in service delivery'.

ANALYSIS

Three Types of Paradigm

Rationalism took root in the 3rd century BC when the Greek philosophers took the stand that knowledge can only be validated through logical reasoning (Bhattacherjee, 2012, pp.6-7). Plato further stated that the world of absolute abstract constructs and ideas are real while the real things of this world could be false or unreal. This is true for mathematical concepts such as shapes and volumes and the relationship between the radius of a circle and its circumference or area.

Positivism

In the 1600 century, Francis Bacon, an English philosopher came up with the idea of empiricism that all things can be proved by physical observation in time and space through systemic collection of data, comparison, analysis, and interpretation. Later, Karl Popper observed in the post-positivism era that human knowledge is transient as it can hold true for some time before it is proven wrong from superior knowledge or new and improved methods of investigation. He held the view that it is difficult to prove the truth, but it is not impossible to disprove falsehoods (Bhattacherjee 2012, p.8). The anti-positivists held contrarian views. Auguste Compte, the French sociologist and philosopher, came up with positivism as a blend between rationalism and empiricism. It was akin to what is now known as mixed methods or triangulation.

Critical Theory emanated from the works of Karl Marx and Frederick Engels, *Das Kapital* published in 1848 which sparked many revolutions in Germany, Russia and France. In the 20th century, Habermas refined the ideas of Marx and Engels into the Critical Theory which is a kind of Action-oriented participant/observation research which identifies, analyses problems, and takes action to fix those problems to improve the condition of communities (Bhattacherjee). This approach is used in change management in companies, organisations, in schools, for medical research, and in college surveys. This poses problems of access which may require covert approaches in these ethnographic studies (Bryman & Bell, n.d., pp. 428-436; Dawson, 2002, pp. 102-105) The study can either be a cross-sectional, spatial, one-off study or longitudinal time series study of the same phenomenon at different time periods (Kumar, 2010, p.109)

CONCLUSION

Research methods can be descriptive research, exploratory research and or explanatory research. These approaches depend on the topic, the discipline, the phenomenon involved and other influences and expectations based on issues of economy, research reliability, inclination of the researcher, expectations of sponsors, institutional procedures, among others. Research paradigms establish the rationale for following a particular research methodology rather than another one. Philosophical and practical necessities drive or determine the methodology used by a researcher. Paradigms used also depend upon the maturity and expertise of the researcher.

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