



# Research Methodology: A Synthesis Study of Investigating Education

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## Abstract

In academic research, it is quite essential to know the merits of the qualitative approach, quantitative approach and mixed method approach, think about the philosophy of research methodology and the importance of the ethical dimensions for educational research, moreover, how this plays a key role in developing research approach. The aim of this research is to provide an overview of approaches to research in education and help to equip researchers both to understand and evaluate research studies and to carry out a small-scale research study. In that case, researchers could compare and contrast the advantages and disadvantages of such approaches to find the most suitable research approach to fit the research purpose. Hence, this is a question-oriented research study and hopefully, it could give researchers a brief overview of how to investigate research and an understanding of the nature and purpose of educational research and the roles that research can play in education systems. Furthermore, it enhances and enriches a critical approach to the evaluation of research methods and their application in particular contexts and knowledge of the range of approaches to research design and data collection and analysis.

## Keywords

Qualitative approach, quantitative approach, mixed method approach, research method, questionnaire survey, interview, ethics

## 1. The merits of research methodology and the differences between qualitative approach, quantitative approach and mixed method approach

Research methodology is the scientific study of how to develop and explore social relationships and human society, which plays an important role in social sciences. According to that methods and methodology are the basis of solving the surrounding problems and processes. Researchers start the research process from the perspective of empirical theory and receive a long period of training that is related to technical aspects of research methods. The merits of research methodology could help researchers to find answers to questions and examine those questions in perspective of philosophy and politics; during the process of research methodology, researchers should focus on norms and standards of accumulated research (May, T., 2011).

### 1.1 Qualitative Approach

Qualitative is a non-statistical methodology that records oral data in form of interview or case study, and is transcribed in text form such as documents and notes (Holliday, A., 2015). It is the collection and analysis of language data

that is applied in linguistic. Data collected in qualitative approach is non-numerical and open-ended that is analysed by non-statistical methods (Holliday, A., 2015). Hence, the result of qualitative approach is diverse, constructive, creative, subject, detailed and lacks statistical generalization (Smith, B., 2018).

The exploratory nature of qualitative approach is that it is an effective and flexible way to explore new unknown areas. It could answer 'why' questions; deepen understanding to some complicated situations; longitudinal examination of dynamic phenomena interestingly; and help to distinguish real phenomena from intellectual fabrications (Holliday, A., 2015). According to qualitative is the substitute for sharp conceptual thinking and insightful analyses.

Qualitative approach is an in-depth and scientific approach that data could be in many forms such as recorded language task or student essay (various length) and it is quite time-consuming and time- and context-bound; hence, the sample size is comparably small, and lacks statistical generalization. It is labour-intensive and subjective approach that researchers should be aware of their personal bias, stereotype to the research. According to Holliday (2015) in qualitative research that 'truth' is relative and 'facts' depend on individual perception (p. 54).

## 1.2 Quantitative Approach

Quantitative approach is systematic, rigorous, centralized and strictly controlled involving accurate measurement and producing reliable and reproducible data, which can be extended to other environments (Phakiti, A., 2015). Researchers should use mathematical tools to analyse the research data. It is not only a basic research paradigm in the study of social science, and it is also one of the important steps and methods of scientific research (Phakiti, A., 2015).

In the process of data analysis, researcher should calculate the mean and standard deviation across the whole observed group of participants. In this way, researcher is not able to make a fair judgment on the subjective diversity of individual life. In other words, the overall exploration ability of quantitative research is quite limited. Quantitative approach is not very sensitive in finding the cause of a particular observation or the dynamics underlying the examined situation or phenomenon (Phakiti, A., 2015). Researchers might get similar scores from different research processes.

## 1.3 Mixed Method Approach

Mixed method approach is a combination of qualitative and quantitative methods, either at the data collection level or at analysis level to attain the best research effect (Ivankova, N. V. & Greer, J. L., 2015). Research is required to match of the research question/topic with the method to meet 'design validity' of the research and argue for a 'fitness for purpose' selection (p. 63). Denzin, N. K. (1978) advocates that triangulation is one of the most effective way to reduce the systematic bias in mixed method approach by offsetting them with the advantages of another approach, the inherent weaknesses of each approach are reduced; in this way it offers strong validity evidence.

## 1.4 Philosophy of Research Methodology

Research methodology is a philosophical term, which refers to the scientific tools and means to discover new phenomena, raise new concepts and reveal the internal laws of things (Crossan, F. 2003). It is positive, interpretative, pragmatic, rational and realistic. This is a genre of critical thinking with scientific wisdom, which usually includes literature investigation, observation, speculation, behaviour research...etc. Methodology constitutes the theoretical rationale or justify the research methods to a field of study (appropriately Domyei, Z., 2007).

Research methodology is a descriptive analysis, identify the main elements of qualitative and quantitative approaches. Every reasonable assertion can be scientifically verified with basis of understanding and developing of the topic. The research philosophy enables researchers to evaluate different methodologies and methods and avoid inappropriate and unnecessary work by identifying the limitations of particular approaches as early as possible; moreover, it can also help researchers to be creative and innovative in choosing or adapting previously inexperienced methods (Crossan, F., 2003).

## 2. Research Methods

### 2.1 Questionnaire Survey

Survey is a very popular method in research and provides 'a rapid and relatively inexpensive way of discovering the characteristics and beliefs of the population at large' (p. 89). According to (Cohen, L., Manion, L., & Morrison, K., 2011) explain that survey is a method 'gather data at a particular point in time with the intention of describing the nature of existing conditions, or identifying standards against which existing conditions can be compared, or determining the relationship between specific events' (p. 205). Questionnaire is one of the methods of survey research.

The character of questionnaire survey method is about to collect data from large sample size (participants). The purpose of the survey method is to demonstrate the characteristics of a specific group of people by conducting a survey among some of them. Ackroyd, S. (1992) points out that survey is made of four characters: factual, attitudinal, social psychological and explanatory (Ackroyd, S., 1992). Survey could effectively measure public attitudes, facts and behaviours by switching from in general to something in particular 'hard data' basis of factual survey (p. 89). Hence, researchers could get information from participants from their objective material situation rather than their subjective attitudes or opinions.

In preliminary work of questionnaire survey, researchers should bear in mind these principals. Reliability and validity refer to that researcher get same results from different groups at different time, which increase confidence towards research result. Moreover, because surveys are theoretically oriented, researchers should spend time on reading scholars and articles to develop a testable hypothesis. Pilot test could be placed before conducting among the full sample.

During the process of questionnaire survey, researcher should take participants' characteristics (e.g., language level, diversity, educational background, semantic differential scale) into consideration, construct questions clearly and unambiguously, and avoid some sensitive, repetitive or irrelevant questions to increase response rate and make each question be relevance to each other. Furthermore, the questions in survey are demographic or face sheet information, explanatory variables; factual questions, opinion questions, open and closed questions, which could be analysed by a version of statistical analysis software called SPSS (May, T., 2011).

## 2.2 Interview

According to May, T. (2011) that the fundamentals of interviews and interviewing are 'the methods of maintaining and generating conversation with people on a specific topic or range of topics and the interpretations which social researchers make of the resultant data' (p. 120). It could be applied in biographies, opinions, values, feelings and attitudes. There are four types of interviews in social research, they are unstructured interview, structured interview, semi-structured interview and group and focus interview. Normally in a research project, researcher will two or more types in the project along with a quantitative- qualitative dimension.

The character of unstructured interview is open-ended. Rather than researcher raises questions on the list and makes interviewees feel free to answer in the form of conversation, unstructured interview uses notes to jog the memory. Segert, A. and Zierke, I. (2000) conclude that unstructured interview could 'reveal the subjective basis for lasting social change in patterns of perception and behaviour of particular social group' (p. 230).

Structured interview is associated with survey research (May, T., 2011), a technology uses questionnaire survey to collect data, researcher raises a series of specific questions, which may have a fixed range of answers, and controls the interview by determining the questions in advance.

Researcher conducts a semi-structured interview by asking a list of questions or main points to each of the interviewee. Interviewer will clarify and elaborate questions so that they have identical standardization (Fielding, N. G., 1988) points out that semi-structured interview is 'a thematic guide with probes and invitations to expand on issues raised' (p. 212). Interviewees feel free to answer on their own term. Last but not least, group and focus interview forms a valuable tool for researchers to explore the group norms and the dynamics of the issues and topics they want to investigate (May, T., 2011).

Hence, interview is an in-depth qualitative approach, which is expensive, time-consuming, more instrumental and less theoretical consideration. Data derived from interview is based on interviewees' subjective opinion and attitude, and it might be one-sided and inaccurate and only reflect their personal experience; only interviewee witnesses the whole context could have full/ thorough understanding. Interview does help researcher to understand how people think about the incident and why they do it.

## 3. The ethical dimensions for educational research

Social science research could develop the vision, mission and ethical value of a democratic society and ethics is the priority of all social science research. All educational researches should be conducted in good faith and respect every participant, their privacy, race, diversity ...etc. Researcher should bear in mind that ethical dimensions in the research to five aspects: participants; sponsors, clients and stakeholders; community of educational researchers; publication and dissemination; and researchers' wellbeing and development. Researcher should apply the most appropriate methods to align with their research purpose. Hence, Researcher should take the social responsibility when they plan, conduct and report their research and their purpose strive to maximize benefits and reduce harm in all circumstances, socio-cultural context.

Researcher should think from different perspectives to think about that how to behave ethically and meanwhile make sure the integrity of the research with methodological considerations. Furthermore, in educational research, according to Dornyei, Z. (2007) that ethical dimensions should depend on researchers' professional reflexivity and integrity of researchers to maintain high standards; moreover, researchers pursue a flexible, dynamic and contextualized approach to ethical decision making.

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