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DOI: <https://doi.org/10.47344/031nw895>*Moh Rosyid Mahmudi^{1*}, Sujarwo Sujarwo², Woro Sri Hastuti³, Mulyo Prayitno⁴*¹Dharmas Indonesia University, Indonesia^{2,3}Yogyakarta State University, Indonesia⁴Safin Pati University, Indonesia*e-mail: mohrosyidmahmudi@gmail.com

PRIMARY EDUCATION RESEARCH METHODS: A REVIEW OF THE PHILOSOPHY AND BASIC CONCEPTS OF RESEARCH

Abstract. This article examines research methods used in the context of primary education with a focus on philosophy, approaches, data collection techniques, and validity and reliability. There are two main approaches that are often used: quantitative and qualitative. Quantitative approaches focus on measuring learning outcomes and the effectiveness of educational interventions, while qualitative approaches explore the subjective experiences of students and teachers in the teaching-learning process. Common data collection methods include surveys, observations, interviews and document analysis, each of which has the strength of providing different insights into educational phenomena. Validity and reliability are two important aspects in determining the quality of research, with validity referring to the ability of research to measure what it is intended to, and reliability guaranteeing the consistency of research results. This article highlights the importance of appropriate method selection and rigorous evaluation of validity and reliability to support evidence-based decision-making in education.

Keywords: primary education, research methods, quantitative, qualitative, validity, reliability.

INTRODUCTION

Research in primary education plays an important role in understanding and improving the quality of learning in primary schools. As primary education lays the foundation for students' cognitive, social and emotional development, research conducted in this area must have appropriate, valid and reliable approaches. In this context, the research methods used should reflect the complexity of primary education, where academic, social and cultural aspects interact with each other.(Downs, 1990).

Quantitative and qualitative approaches are the two main approaches used in primary education research. Quantitative research is often used to measure student learning outcomes, the effectiveness of educational interventions and other factors that can be measured statistically. Qualitative research, on the other hand, emphasizes in-depth understanding of the teaching-learning process, social interactions in the classroom, and the subjective experiences of students and teachers (Creswell, 2023). Both approaches have their strengths and weaknesses, and it is often necessary to combine them through a mixed-methods approach to get a more comprehensive picture.(Johnson & Onwuegbuzie, 2004).

In addition to methods, the validity and reliability of research are also key factors that determine the quality of research results. Validity ensures that the research measures what it is supposed to measure, while reliability guarantees that the results obtained are reliable and consistent.(Muijs, 2011). Thus, primary education research requires careful planning, selection of appropriate methods, and evaluation of validity and reliability so that the results obtained can be effectively implemented in improving the quality of primary education.

This study aims to explore the philosophy, basic concepts and relevant research methods in the context of primary education. In doing so, the study will provide a clearer picture of how research can be used to support evidence-based decision-making in primary education.

METHODS

The research method in this article uses a systematic literature review approach to analyse key concepts related to research philosophy and methods in primary education. Data were collected from various academic sources, including books, scholarly journal articles and research reports available in databases such as Google Scholar and Scopus. The main focus of the review was on philosophical research approaches such as positivism and interpretivism, as well as research methods commonly used in primary education, both qualitative and quantitative in nature.

The data collected was analysed using thematic analysis techniques, by grouping the literature into themes such as research design, data collection techniques and data analysis. The results of each theme were compared and critically discussed to understand how these philosophical concepts are applied in primary education research. The validity of the review was ensured by selecting literature from verified and peer-reviewed sources and ensuring that each stage of the analysis was conducted systematically and consistently.

RESULTS AND DISCUSSION

In this review, we analyzed various literatures related to research methods in primary education. The study revealed that the research philosophy underlying the methods used plays an important role in determining the approaches, data collection techniques and analysis chosen by researchers. Moreover, the research methods applied in primary education tend to vary depending on the purpose of the research, with qualitative and quantitative methods being the most commonly used approaches.

1. Philosophy of Research in Primary education

In primary education research, the two main research philosophies often referred to are positivism and interpretivism, each offering very different approaches to understanding and evaluating learning processes and other educational phenomena.

Positivism

Positivism is a paradigm derived from the natural and social science tradition that emphasizes the use of scientific methods in studying educational phenomena. According to the positivist view, reality can be measured objectively and independent of human perception. Research using this approach is usually deductive in nature, where researchers develop hypotheses based on existing theories and test these hypotheses using empirical data collected through quantitative methods such as surveys, standardized tests or controlled experiments. In the context of primary education, positivism is often used to measure student performance, curriculum effectiveness, or the impact of educational interventions on student learning achievement (Park et al., 2020).

One of the main strengths of positivism is its ability to generalize research results to a wider population through statistical methods. For example, research on the effectiveness of reading intervention programs using positivism can yield conclusions that can be applied to a wide range of similar educational contexts. In addition, positivism supports strong external validity, as results obtained from research can be re-tested and replicated in other studies. However, criticisms of this approach arise from its limitations in understanding the complexity of education, especially aspects that cannot be measured quantitatively, such as students' experiences in the learning process or social dynamics in the classroom (Sugiyono, 2017).

Interpretivism

In contrast, interpretivism emphasizes the importance of subjectivity and context in educational research. This paradigm argues that social reality, including education, is shaped by human experience, interpretation and interaction. Therefore, interpretive research tends to be inductive and uses qualitative methods to explore and understand educational phenomena from the perspective of the individuals involved, such as students, teachers and parents. Data collection techniques such as in-depth interviews, participatory observation and case studies are often used in interpretive research to explore a richer and more complex understanding of a phenomenon (Pervin & Mokhtar, 2022).

The interpretivist approach is suitable for investigating learning processes in depth, such as how students shape their knowledge through social interactions in the classroom or how cultural backgrounds influence the way students view education. Internal validity is emphasized in

interpretivism, as researchers aim to understand the phenomenon from the participants' point of view and ensure that their interpretations are accurate and reflect real experiences in the field. One of the weaknesses of this approach is its limitation in generalizing research results, as interpretivism prioritizes in-depth understanding of a specific context rather than generating broadly applicable conclusions (Jungwirth, 2003; Smith & Osborn, 2008).

Comparison and Integration of Approaches

Both positivism and interpretivism offer valuable perspectives in primary education research, but each has different strengths and weaknesses. Positivism excels in providing objective, quantifiable results and facilitating the generalization of results to a wider population. On the other hand, interpretivism offers an in-depth understanding of the educational context and individual experiences, which often cannot be explained by statistical figures alone (Arikunto, 2010; Creswell, 2023; Sugiyono, 2017).

Many researchers in education today recognize that the two approaches are not mutually exclusive. Instead, they can be used complementarily in broader research. Mixed methods approaches, which combine elements from positivism and interpretivism, are increasingly popular in education research as they provide a more comprehensive perspective. For example, in primary education research, quantitative surveys can be used to identify common patterns in student learning outcomes, while qualitative interviews can provide in-depth insights into the reasons behind those patterns (Johnson & Onwuegbuzie, 2004).

By understanding and integrating these two philosophies, researchers can conduct more comprehensive and in-depth primary education research, which not only produces objective data but also appreciates the complexity and social dynamics of the educational process.

2. Qualitative and Quantitative Approaches in Primary Education Research

Qualitative and quantitative approaches are the two most commonly used methods in primary education research, each with a different focus and purpose. Quantitative research in primary education usually focuses on measuring and evaluating numerically quantifiable outcomes. These studies often use surveys, structured questionnaires and standardized tests to collect numerical data from large populations (Gatiat et al., 2022; Sadykova & Serikbay, 2021). The data are then analyzed using descriptive and inferential statistics to draw conclusions about relationships between variables or test specific hypotheses. For example, in a study examining the relationship between learning motivation and student academic achievement, quantitative methods allow researchers to predict how these variables significantly relate to each other across different educational contexts (Almeida et al., 2017; Hoy & Adams, 2016).

The advantage of quantitative methods lies in its ability to generate broader generalizations of results through the collection of representative data. This technique also allows researchers to identify patterns or trends that can be applied to various populations, making it important in primary education when researchers want to measure the effectiveness of educational interventions or student performance on a larger scale (Anayatova & Kostaubayeva, 2020; Gatiat et al., 2022; Hikmah et al., 2024; Sadykova & Serikbay, 2021). However, quantitative research is often criticized for its limitations in capturing the nuances or complexities of the educational process. For example, the influence of culture or social context on students' learning motivation may not be apparent through pure statistical analysis (Creswell, 2023).

Qualitative research, on the other hand, emphasizes an in-depth understanding of individual experiences within a particular social context. In the context of primary education, this approach is used to explore how students, teachers and parents interact and understand the education process. Methods such as in-depth interviews, participatory observation and case studies are often used to explore educational phenomena from the participants' perspective, highlighting their personal experiences and social interactions. Qualitative research has the ability to unearth a richer and more contextualized understanding of how students form knowledge, interact in learning environments and are influenced by social and cultural factors (Merriam & Tisdell, 2016).

Qualitative methods often involve inductive analysis, where data is analyzed to identify emerging themes or patterns. In primary education research, for example, researchers may use open-ended interviews with students and teachers to understand how students experience difficulties in understanding certain concepts or how social interactions in the classroom influence learning dynamics. Contextual validity in qualitative research is prioritized, as the researcher seeks to understand the complexity of the phenomenon being studied in its specific context (Creswell, 2023).

Some researchers have started using a mixed methods approach in primary education research, which combines elements from quantitative and qualitative methods to provide a more comprehensive picture of educational phenomena. In this approach, quantitative surveys can be used to identify common patterns in student learning, while qualitative interviews help uncover the in-depth reasons behind these patterns. For example, a study could use surveys to quantitatively measure motivation to learn among students, then follow up with in-depth interviews to explore students' individual experiences of how that motivation is influenced by their family and social environments.

This blended approach is considered effective in capturing a more holistic picture, as it allows researchers to integrate broad quantitative results with deeper qualitative insights. This is particularly important in primary education, where the factors that influence student learning and outcomes are diverse and often involve complex social dynamics. (Downs, 1990; Johnson & Onwuegbuzie, 2004).

As such, these two approaches, both quantitative and qualitative, offer different yet complementary perspectives in primary education research.

While quantitative methods provide results that can be generalized and allow for broad predictions, qualitative methods help to understand the deep experiences and social context underlying the learning process. A blended approach brings together the strengths of these two approaches to produce richer and more comprehensive research in understanding the challenges and opportunities in primary education.

3. Data Collection Techniques in Primary education Research

Data collection techniques are an important aspect of primary education research as they determine the quality and accuracy of the information obtained. In this research, some of the main techniques often used are surveys, observations, interviews and document analysis, each of which has advantages and limitations depending on the context and purpose of the research.

Surveys are often used in quantitative approaches to collect data from large populations. Surveys allow researchers to objectively measure variables such as students' motivation, attitude, behavior and academic performance. In primary education, surveys usually involve structured questionnaires designed using Likert scales to measure student or teacher responses to various aspects of education. This scale allows respondents to indicate the extent to which they agree or disagree with the statements presented, providing researchers with numerical data that is easily analyzed using statistical methods. The advantage of surveys is their ability to collect data from a broad and representative sample, thus allowing the researcher to make broader generalizations about the population under study (Cohen et al., 2018; Creswell, 2023).

However, a major limitation of surveys is their reliance on the validity and reliability of the questionnaires used, as well as the possibility of bias from respondents who may not give honest answers or those that match their reality. To address these issues, researchers often use validity and reliability tests before questionnaires are widely used to ensure that the instrument is able to consistently measure what it is intended to measure.

On the other hand, observation is a very important qualitative data collection technique in understanding social interactions and student behavior in the classroom. Observation allows researchers to witness first-hand how teachers teach, how students participate in learning, and how social interactions in the classroom affect the dynamics of learning. This observation technique provides researchers with a more contextualized picture of the educational environment, which is often difficult to achieve through quantitative methods. In primary education research, participatory observation is often used to capture details of complex classroom interactions, such as how students

collaborate with each other or how they respond to specific educational interventions (Merriam & Tisdell, 2016).

Observation has the advantage of providing rich real-time data, but it also has its challenges. One challenge is the potential for observer bias, where the researcher's presence in the classroom may alter the behavior of the students or teachers being observed. In addition, analyzing data from observation requires good interpretation skills, as the data obtained is often narrative in nature and requires deciphering the themes that emerge from complex interactions (Downs, 1990).

Interviews are also an invaluable qualitative data collection technique in primary education, especially when researchers want to explore the perceptions, understandings and experiences of individual students or teachers. Interviews allow researchers to dig deeper into how students understand learning, the challenges they face and how social and cultural factors influence their learning experiences. In primary education research, interviews are usually semi-structured, where the researcher has a list of questions but also gives the respondents the freedom to explore the topic further according to their experiences. This technique allows flexibility and speed of adaptation to unexpected responses (Arikunto, 2010; Sugiyono, 2017).

The main advantage of interviews is the ability to uncover emotional and subjective details of participants' experiences, which often cannot be obtained through other methods. However, interviews also have limitations, especially in terms of time and greater costs compared to methods such as surveys. In addition, interviews are also susceptible to researcher bias, where the researcher may unconsciously influence respondents' answers through body language or unexpected questions (Creswell, 2023).

In addition, document analysis is also a useful data collection technique in primary education research. Documents such as teacher notes, student portfolios or school policies can provide additional context that is very useful to complement data obtained through surveys, interviews or observations. Document analysis allows researchers to see patterns or trends that may not be obvious in other data and is often used as a secondary data source in education research. For example, teachers' diaries can provide insights into the teaching strategies used and how they tailor teaching methods to the needs of students (Merriam & Tisdell, 2016).

In primary education research, it is important for researchers to choose data collection techniques that best suit their research objectives and consider how these techniques can complement each other. A combination of techniques, such as surveys to get an overview and interviews to understand individual perspectives, often provides richer and more thorough results.

4. Validity and Reliability in Primary education Research

Validity and reliability are essential concepts in ensuring the quality and reliability of a study, especially in primary education, where research results are often used to design educational policies and teaching practices. Validity refers to the extent to which a measurement tool or research procedure actually measures what it is supposed to measure, while reliability refers to the consistency of results obtained from the same study if conducted at different times or by different researchers. The importance of these two concepts cannot be overlooked as they affect the interpretation and generalization of research findings in a broader context (Cohen et al., 2018; Creswell, 2023).

In quantitative research, external validity is the main focus, which is the extent to which the results of the study can be generalized to a larger population. To achieve external validity, researchers need to ensure that the sample used is representative of the intended population and large enough to provide generalizable results. For example, educational research assessing the effectiveness of learning programs should consider population variations such as differences in students' social, economic and cultural backgrounds. The use of empirically validated instruments, such as standardized tests recognized in the field of primary education, also helps to ensure that measurements truly reflect the variables under study, such as students' academic ability or motivation (Muijs, 2011).

For reliability in quantitative research, it refers to the consistency of the measuring instrument or the results obtained when the study is repeated under similar conditions. This reliability is often tested through techniques such as test-retest reliability, internal consistency reliability, or inter-rater

reliability. High reliability signifies that the results obtained from the measuring instrument will be consistent, regardless of time or research conditions. For example, a student motivation questionnaire should give similar results when tested on the same group of students at two different times, if external conditions do not change (Creswell, 2023).

In contrast, in qualitative research, validity is more often focused on internal validity, which refers to the credibility and accuracy of the findings within the context under study. One way to achieve internal validity is through triangulation, which is the use of multiple data sources, methods or theories to verify the consistency of information. For example, triangulation in primary education research may involve a combination of interviews with teachers and students, classroom observations and analysis of documents such as lesson reports. Triangulation assists researchers in ensuring that their findings are not based solely on a single source of data that may be biased or incomplete (Merriam & Tisdell, 2016).

In addition to triangulation, deep involvement of the researcher in the research context also plays an important role in enhancing validity. In qualitative research on primary education, for example, researchers may need to spend a long time in the field to truly understand social interactions and classroom dynamics. This approach allows the researcher to understand the participants' experiences more holistically, and thus provide more accurate interpretations of the data. In this way, researchers can increase confidence in their findings, known as credibility in the qualitative validity framework (Hoy & Adams, 2016).

Whereas reliability in qualitative research, although less emphasised than quantitative research, is still important to ensure dependability of results. Dependability is similar to reliability in quantitative research, but emphasises the consistency of the research process rather than the results obtained. This is achieved by meticulous documentation and transparency in the process of data collection, analysis, and interpretation, so that the research can be reviewed and replicated by other researchers in the same context (Merriam & Tisdell, 2016).

Thus, in both quantitative and qualitative research in primary education, validity and reliability are very important factors. Validity ensures that the research is relevant and accurate in measuring what it is intended to measure, while reliability guarantees the consistency of the research results, which in turn will increase the generalisability and credibility of the findings. To achieve good research quality, researchers must carefully select appropriate instruments and data collection strategies and conduct rigorous validation and reliability testing processes.

CONCLUSION

The results of this study have several important implications for research in primary education. Firstly, researchers should consider the underlying philosophy of their research methods as this affects the design, data collection techniques and analysis used. Secondly, the use of mixed methods provides a more complete perspective on educational issues as it combines the strengths of both quantitative and qualitative methods. Thirdly, it is important for researchers to pay attention to validity and reliability in each stage of the research as this will affect the reliability of the research results.

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Moh Rosyid Mahmudi^{1*}, Sujarwo Sujarwo², Woro Sri Hastuti³, Mulyo Prayitno⁴

¹Dharmas Indonesia University, Индонезия

^{1,2,3,4}Yogyakarta State University, Индонезия

⁴Safin Pati University, Индонезия

e-mail: mohrosyidmahmudi@gmail.com

БАСТАУЫШ БІЛІМ БЕРУДІ ЗЕРТТЕУ ӘДІСТЕРІ: ФИЛОСОФИЯҒА ШОЛУ ЖӘНЕ ЗЕРТТЕУДІҢ НЕГІЗГІ ТҮСІНІКТЕРІ

Аңдатпа. Бұл мақалада философияға, тәсілдерге, деректер жинау әдістеріне, негізділігі мен сенімділігіне назар аударып, бастауыш білім беру контекстінде қолданылатын зерттеу әдістері қарастырылады. Жиі қолданылатын екі негізгі тәсіл бар: сандық және сапалық. Сандық тәсілдер оқытудың нәтижелері мен білім беру шараларының тиімділігін өлшеуге бағытталған, ал сапалық тәсілдер оқыту-оқыту үдерісіндегі оқушылар мен мұғалімдердің субъективті тәжірибесін зерттейді. Мәліметтерді жинаудың жалпы әдістеріне

сауалнамалар, бақылаулар, сұхбаттар және құжаттарды талдау жатады, олардың әрқайсысы білім беру құбылыстары туралы әртүрлі түсініктерді қамтамасыз ететін күшке ие. Валидтілік пен сенімділік зерттеудің сапасын анықтаудың екі маңызды аспектісі болып табылады, валидтілік зерттеудің мақсатын өлшеу қабілетіне сілтеме жасайды және сенімділік зерттеу нәтижелерінің дәйектілігіне кепілдік береді. Бұл мақала білім беруде дәлелді шешім қабылдауды қолдау үшін сәйкес әдісті таңдаудың және негізділік пен сенімділікті қатаң бағалаудың маңыздылығын көрсетеді.

Түйін сөздер: бастауыш білім, зерттеу әдістері, сандық, сапалық, негізділік, сенімділік.

Moh Rosyid Mahmudi^{1}, Sujarwo Sujarwo², Woro Sri Hastuti³, Mulyo Prayitno⁴*

¹Dharmas Indonesia University, Индонезия

^{1,2,3,4}Yogyakarta State University, Индонезия

⁴Safin Pati University, Индонезия

e-mail: mohrosyidmahmudi@gmail.com

МЕТОДЫ ИССЛЕДОВАНИЯ НАЧАЛЬНОГО ОБРАЗОВАНИЯ: ОБЗОР ФИЛОСОФИИ И ОСНОВНЫХ КОНЦЕПЦИЙ ИССЛЕДОВАНИЯ

Аннотация. В этой статье рассматриваются методы исследования, используемые в контексте начального образования, с акцентом на философию, подходы, методы сбора данных, а также валидность и надежность. Существует два основных подхода, которые часто используются: количественный и качественный. Количественные подходы фокусируются на измерении результатов обучения и эффективности образовательных вмешательств, в то время как качественные подходы изучают субъективный опыт учащихся и учителей в процессе преподавания-обучения. Распространенные методы сбора данных включают опросы, наблюдения, интервью и анализ документов, каждый из которых имеет силу предоставления различных представлений об образовательных явлениях. Валидность и надежность являются двумя важными аспектами в определении качества исследования, причем валидность относится к способности исследования измерять то, для чего оно предназначено, а надежность гарантирует согласованность результатов исследования. В этой статье подчеркивается важность выбора соответствующего метода и строгой оценки валидности и надежности для поддержки принятия решений на основе фактических данных в образовании.

Ключевые слова: начальное образование, методы исследования, количественный, качественный, валидность, надежность.

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