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Exploring The Effectiveness of E-Learning: A Scoping Review of Qualitative and Quantitative Research

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ABSTRACT

E-learning has emerged as a modern and widely adopted method of education that utilizes electronic systems for educational programs. Its popularity stems from its affordability, flexibility, and ability to transcend geographical boundaries. However, challenges exist in implementing e-learning through mobile technologies due to inadequate infrastructure and support. As the demand for accessible and adaptable learning methods increases, researchers and educators must optimize the online learning experience and address associated challenges. Qualitative and quantitative research methods have been employed to study e-learning, offering in-depth understanding and objective measurements. This article presents a scoping review of qualitative and quantitative research in the context of e-learning, highlighting their respective strengths and limitations. The findings illustrate the diverse range of topics explored through these methods, demonstrating their value in enhancing e-learning practices and interventions. By combining qualitative and quantitative approaches, researchers.

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1. INTRODUCTION

E-learning is a modern way of learning that uses electronic systems for educational programs. It's gaining widespread popularity, and as a result, there is a significant increase in the number of e-learning programs available. E-learning is rapidly growing as an alternative way of delivering education (Rouleau, et al., 2019). The appeal lies in its affordability, flexibility, and the fact that it isn't constrained by geographical boundaries, making it attractive to various stakeholders, including universities, and learners (Vaona, et al., 2015). This growing trend reflects the increasing demand for accessible and adaptable learning methods in today's digital age. This accessibility means education can take place anywhere and anytime through our mobile devices. However, research has shown challenges when using mobile technologies to facilitate research (Samuel, Ogunlade, & Onasanya, 2018). In light of these, there's a need for university administrators to provide institutional support and ensure stable electricity, internet facilities, and sufficient mobile technologies to ensure swift implementation of eLearning for instruction.

As e-learning continues to evolve, researchers and educators will need to explore new ways to optimize the online learning experience and address the challenges associated with e-learning to ensure its effectiveness and accessibility. As a result, researchers have begun to study e-learning using both quantitative and qualitative research methods. Qualitative research involves collecting, analyzing, and interpreting data through observation of people's actions and words. Unlike quantitative research, which deals with counts and measures, qualitative research focuses on understanding meanings, concepts, descriptions, and perceptions. The nature of qualitative research is exploratory and open-ended. It typically involves in-depth interviews with a small number of individuals or conducting relatively small focus groups (Monfared & Derakhshan, 2015). Participants are asked broad questions, and the interviewer or group moderator probes and explores their responses to uncover perceptions, opinions, and feelings about the subject. The quality of findings in qualitative research relies heavily on the interviewer or group moderator's skills, experience, and sensitivity.

Qualitative research focuses on understanding its meaning through in-depth descriptions, while Quantitative research aims to describe the phenomenon by measuring its quantifiable characteristics (Sinaga, 2014). For instance, the qualitative approach would focus on understanding the meaning behind students' performance through in-depth descriptions. It would explore the reasons for their performance, the factors that influence it, and how it impacts them personally. On the other hand, the quantitative approach would concentrate on measuring and quantifying students' performance using numerical data, such as test scores or grades. It aims to compare their performance levels to each other and identify patterns and trends in their academic achievements. The combination of these research methods will provide valuable insights into e-learning's impact on learners, enabling continuous improvement and enhancement of online educational programs. As the digital age progresses, it is essential to adapt and innovate to meet the changing needs of learners and educators in the realm of e-learning.

Literature Review

In recent times, e-learning has received considerable attention in higher education due to its ability to provide enhanced access to learning resources online. This approach utilizes technology to facilitate learning regardless of learners' physical locations and schedules,

making it a mainstream component of education. Research has highlighted several factors that impact e-learning success. These include fostering interaction and collaboration between learners and facilitators, taking into account learners' motivation and expectations, using user-friendly technology, and placing learners at the center of the pedagogical process (Regmi & Jones, 2020). However, there is still a need for a deeper understanding of the enablers and facilitators associated with e-learning. Developing appropriate policies and initiatives is crucial to determine when, how, and where e-learning can be most effective. By establishing a broader framework for implementing e-learning effectively, we can maximize its potential and improve the overall educational experience.

E-learning is a modern and extensive approach to education that opens up new possibilities for learning and teaching beyond the traditional classroom setup. In recent years, research in this field has shown a significant increase in e-learning materials (Rodrigues, Almeida, Figueiredo, & Lopes, 2019). It is an electronic teaching and learning system that allows students to study anytime and anywhere. It's a widely adopted concept internationally, as it enables students to learn independently without the need for direct teacher presence. With e-learning, students can review and revisit lessons they have received at school, and it also serves as a valuable tool during the Covid-19 pandemic to prevent the spread of the virus (Damuri, et al., 2021). This concept has been around since the 2000s but gained significant popularity during the pandemic due to its suitability as a medium for learning and teaching, despite its inherent limitations.

The obstacles to accessing e-learning have reduced significantly as both learners and teachers have embraced the excellent opportunities offered by educational technology tools, especially mobile-based learning. Although previous research show that basic facilities for the implementation of mobile devices to facilitate the use of eLearning in the institutions are still posing some obstacles (Samuel, Ogunlade, & Onasanya, 2018). The users have become more familiar and comfortable with interacting in the virtual and digital realm, making e-learning more accessible and widespread than before (Mahyoob, 2021). The increased experience and interaction with these technologies have facilitated a seamless integration of e-learning into the educational landscape, enhancing the overall learning experience for all involved.

The global pandemic serves as a compelling example of a situation that can push schools, universities, and learning professionals to swiftly transition from in-person to e-learning. This shift has emphasized the significance of providing effective e-learning content. As a result, the development of e-learning products and the availability of e-learning opportunities have become one of the fastest-growing areas in education and training. Both offline and online systems are contributing to the accelerating growth of e-learning applications, revolutionizing the traditional methods of learning that we are familiar with (Nariman, 2020). This transformation is changing the landscape of education, making learning more accessible and dynamic for learners worldwide. However, Qualitative research method is one of the approaches to further understanding eLearning.

The main strength of qualitative research is its ability to provide a detailed, in-depth understanding of the social and cultural phenomena being studied. Qualitative research employs various methods to gather subjective information, such as individual in-depth interviews and focus group discussions. This type of research is exploratory and open-ended, allowing for a deeper understanding of social or human issues and the meanings individuals or groups attribute to them (Kandel, 2020). It complements quantitative data by providing

unique insights that quantitative approaches cannot capture. By delving into the experiences, attitudes, and perspectives of participants, qualitative research helps us comprehend the complexities of human behavior and the social world. Its goal is to develop concepts that aid our understanding of social phenomena in natural settings.

In qualitative research, the data and the data gathering process are open-ended and are less structured as compared to quantitative research. Data is usually prepared and organized manually or with the help of qualitative data analysis software like NVivo, MAXqda, or Atlas/ti. The analysis procedures are designed to accommodate the unstructured nature of the data, allowing researchers to derive meaningful insights from the rich and diverse information gathered during the study (Baur, 2019). Qualitative researchers typically assume that social reality is dynamic and shaped by the interactions between individuals and social institutions. They often use unstructured approaches, employing concepts that may not have well-defined and rigid definitions. Sensitizing concepts are commonly used to provide an initial understanding of the subject (Djafar, Yunus, Pomalato, & Rasid, 2021). The research problem may emerge during data collection in the field rather than being predetermined. Similarly, research instruments, like interview guidelines, are usually flexible and adaptable to the specific conditions in which they are applied.

Qualitative research is employed to gain a profound understanding of human behavior, experiences, attitudes, intentions, and motivations. It relies on observation and interpretation to uncover the way people think and feel about a particular subject. In this form of research, the researcher gives greater importance to the views and perspectives of the participants, valuing their insights and subjective viewpoints (Surbhi, 2018). Qualitative research is rooted in interpretive constructs and seeks to elucidate phenomena through subjective reasoning, considering participants' opinions, realities, meanings, attitudes, and motivations that influence their social behavior. By exploring these subjective aspects, qualitative research aims to explain the phenomenon in depth and provides valuable insights into the problem being studied. It goes beyond statistical analysis to offer a richer understanding of the complexities and intricacies of human experiences and behaviors (Wyllie, 2019).

This approach is particularly useful when seeking in-depth information and a deeper comprehension of the underlying factors influencing the subject of investigation. Qualitative research offers several benefits, such as providing insights into behavior and the impact of cross-cultural influences on behavior. It allows for a deeper understanding of the complexities and nuances in human interactions. However, qualitative research also has its limitations. Small sample sizes can make the findings less reliable and challenging to generalize to larger populations (Rahman, 2017). Additionally, some policymakers may not prioritize or request qualitative research, which could limit its broader impact in decision-making processes and thereby opt for the Quantitative research.

Quantitative research involves predetermined options and a large number of respondents. Its focus is on obtaining objective, statistically valid, and quantitative measurements. In other words, it deals with objective hard data and relies on numerical analysis to draw conclusions (Monfared & Derakhshan, 2015). Quantitative research is employed to quantify problems by creating numerical data that can be transformed into statistical analysis. It is utilized to measure attitudes, behaviors, opinions, and other well-defined variables and generalize the outcomes to a larger sampled population. By using measurable data, quantitative research aims to uncover patterns and establish facts in the research process.

Quantitative research is a method that deals with measurable data and investigates phenomena and their relationships systematically. Its primary goal is to answer questions about the relationships between measurable variables and aims to explain, predict, and control phenomena. This approach involves evaluating objective theories by testing the relationships among variables, which can be evaluated using instruments to generate numerical data (Kandel, 2020). Statistical procedures and hypotheses are then applied to analyze the data. Measurement plays a central role in quantitative research as it bridges the gap between empirical observations and mathematical expressions of relationships.

Quantitative methods are advantageous in handling large volumes of data efficiently since numeric data can be processed more easily than qualitative data. For instance, they can calculate averages and make generalizations across populations based on vast datasets. These methods provide a broad overview of a situation and are suitable for making general statements about educational patterns. In quantitative research, standard procedures like calculating averages and producing correlations are well-established, allowing for transparency, accuracy, and replicability of results. However, qualitative inquiry lacks such standardized rules, making it more challenging to measure accuracy and reliability (Intrac, 2020). In the e-learning perspective, researchers may choose between these two approaches based on the scope of their study and the depth of understanding required.

2. METHODS

This study represents an expository research. It allows us to examine the extent and scope of the article activity. The research question on which this work is based seeks to look into the overview of quantitative and qualitative research in E-learning. The scoping reviews are based on E-learning as an effective tool for the instructional processes, review on qualitative research on E-learning and review on quantitative research on E-learning. By searching for relevant studies in databases such as Google Scholar and Scopus, the researcher selected studies in harmony with the area circumscribed by the variables of the research.

3. RESULTS AND DISCUSSION

These studies illustrate the diverse range of topics and issues that can be explored using qualitative and quantitative research in the context of e-learning. By using qualitative and quantitative methods, researchers can capture rich, nuanced data that can help to deepen our understanding of learners' experiences captured by e-learning. These studies demonstrate the value of qualitative and quantitative research in gaining insights into the complex and multifaceted nature of e-learning. By using qualitative and quantitative methods, researchers can explore subjective experiences and perspectives, which can help inform the development of more effective e-learning practices and interventions. These studies demonstrate the potential of qualitative and quantitative research to generate rich, contextualized data that can inform the design and implementation of effective e-learning interventions. By using qualitative and quantitative methods, researchers can gain insights into the complex and multifaceted nature of e-learning, and explore the perspectives and experiences of learners and instructors in depth.

4. CONCLUSION

In conclusion, e-learning has emerged as a transformative and widely embraced approach to education, offering numerous advantages such as affordability, flexibility, and accessibility. As the demand for e-learning continues to grow, researchers and educators have delved into exploring its effectiveness and addressing associated challenges through both qualitative and quantitative research methods. The scoping review of qualitative and quantitative research in the context of e-learning has revealed valuable insights into the multifaceted nature of online learning. Qualitative research has proven instrumental in understanding learners' experiences, attitudes, and motivations, providing a deep and contextualized understanding of the social and cultural aspects of e-learning. On the other hand, quantitative research has offered objective and statistically valid measurements, enabling researchers to analyze patterns and make generalizations across larger populations. By combining qualitative and quantitative research approaches, researchers can create a comprehensive understanding of e-learning's impact on learners, instructors, and institutions.

5. RECOMENDATIONS

In summary, to maximize the effectiveness of e-learning, the following recommendations were made:

1. Integrate e-learning with traditional teaching methods and provide adequate support and guidance for learners.
2. Design e-learning programs that are interactive, collaborative, and personalized.
3. Use qualitative and quantitative research methods to gain insights into the experiences and perspectives of learners, teachers, and other stakeholders in the e-learning environment, and use these insights to improve the design and delivery of e-learning programs.

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