Enhancing Kindergarten Teachers' Implementation of Integrated Learning through an Interactive Online Platform: A Case Study in the UAE

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Abstract

This study explores the impact of an online website on enhancing kindergarten teachers' capabilities in implementing integrated learning in their classrooms. Integrated learning is crucial for fostering connections across various subjects, enabling students to create meaningful links between different domains. A mixed-methods approach was employed, combining quantitative data from a post-evaluation survey with qualitative insights. A prototype website was developed, providing resources across three main subjects—English, Mathematics, and Science—based on specific themes. The effectiveness of this website was evaluated through feedback from 17 kindergarten teachers in Al Ain, United Arab Emirates (UAE), using a survey distributed via email. Findings indicate that the website was successful in aiding teachers to implement integrated learning, with a significant majority reporting the utility of the resources in integrating subjects effectively. Teachers found the website easy to navigate and the materials relevant and applicable to classroom settings. Feedback also highlighted areas for improvement, including features for teacher contributions and continuous resource updates. The study confirms the potential of technology, particularly websites, in supporting integrated learning initiatives in early childhood education. This research underscores the importance of integrating technology into teaching strategies to enhance integrated learning. For policymakers and educators, the study suggests investing in digital platforms that offer accessible, relevant, and engaging educational resources. Future research should focus on expanding the website's functionalities and exploring its impact across a broader demographic.

Keywords: *Digital education, early childhood education, kindergarten teachers*

Introduction

Integrative learning is a pedagogical approach that enables students to make connections across different subjects in the curriculum (Miller, 2005). This approach encompasses connecting skills and knowledge from diverse sources and experiences, applying learned skills in various settings, using multiple perspectives in different situations, and understanding issues contextually (Alshehhi, 2024). Given today's global challenges, it is imperative for students to develop the ability to see connections, think critically, and distinguish between knowledge, theories, and contexts to grasp the broader picture (Hill et al., 2023).

Integrative learning can facilitate effective collaboration among students, allowing them to bridge cultural differences, consider numerous viewpoints, and address complex problems with innovative solutions (Miller, 2005). Research indicates that college students often change careers frequently throughout their lives (Charles, 2021). Through integrative learning, students become adaptable and capable of reinventing their careers as needed. Some scholars argue that integrative learning should be a foundational element of early childhood education, providing opportunities for young children to learn various concepts, terms, and daily experiences. Most importantly, integrative learning helps children establish meaningful links between fundamental subjects such as Science, Mathematics, English, and Technology without imposing rigid boundaries (Geneseo, 2022).

The Emirates Foundation for School Education supports the concept of integrative learning and encourages its daily use in classrooms. According to the Emirates Foundation, effective integrative learning begins with understanding the learner and her specific needs (Emirates Schools Establishment, 2022). This research aims to explore how a dedicated website can assist kindergarten teachers in implementing integrative learning more effectively. The study examines how technology can support teachers in

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promoting integrative learning and identifies the main connections between technology and integrative learning for kindergarten students. The research questions for this study are as follows:

- RQ1 - What challenges do kindergarten teachers face in applying integrative learning in the classroom?

- RQ2 - How important is integrative learning for kindergarten children?

- RQ3 - To what extent can the use of a website assist teachers in applying integrative learning in the classroom?

- RQ4 - What is the connection between technology and integrative learning?

This study is significant as it addresses the need for effective tools to support kindergarten teachers in implementing integrative learning. By focusing on the use of technology, particularly a dedicated website, this research contributes to the growing body of literature on digital education. The findings may offer valuable insights for educators and policymakers in the United Arab Emirates (UAE) and beyond (Miles et al., 2021), highlighting the potential of digital platforms to enhance teaching strategies and promote integrative learning in early childhood education.

Literature Review

Integrative learning is an educational approach that encourages students to make connections across different subjects, integrating knowledge, skills, and experiences to foster a holistic understanding of various concepts. This pedagogical method is essential in today's world, where complex global challenges require critical thinking and the ability to see interconnections between disparate domains (Miller, 2005). The integration of subjects helps students develop the ability to apply learned skills in diverse settings, understand multiple perspectives, and solve complex problems innovatively.

Connectivism is a theoretical framework for understanding learning in the digital age. Proposed by Siemens (2004) and further developed by Stephen Downes, connectivism recognizes the impact of technology and networked environments on learning processes. Unlike traditional learning theories such as behaviourism, cognitivism, and constructivism, connectivism emphasises the role of social and cultural contexts and the importance of connections in learning. Connectivism asserts that learning occurs through the diverse perspectives and opinions available in a network. The value of a network lies in its diversity and the ability to tap into various viewpoints and sources of information. Connectivism suggests that knowledge is distributed across a network of connections, and learning consists of the ability to construct and traverse these networks. This means that understanding and knowing are less about individual accumulation of information and more about the ability to find and navigate sources of knowledge. Furthermore, with the advent of technology, knowledge can be stored and processed in non-human devices. Tools such as databases, computers, and the internet become extensions of the human brain, storing vast amounts of information that individuals can access and use. Additionally, in the context of rapidly changing information landscapes, the ability to learn new things and stay current is more important than possessing static knowledge. Continuous learning and adaptation are emphasised.

Connectivism also proposes that building and sustaining connections within a network are crucial for ongoing learning. This involves engaging with others, sharing information, and actively participating in communities of practice. It also suggests that recognising and understanding the relationships between different concepts and ideas is fundamental in connectivism. This skill enables learners to integrate and apply knowledge from various domains effectively. Moreover, staying informed with the latest knowledge and developments is essential. In a digital age where information changes rapidly, learners must continuously update their knowledge bases. Interestingly, it also asserts that making choices about what information to pursue and which connections to make is an integral part of learning. The knowledge

landscape is constantly shifting, and the ability to discern relevant information and make informed decisions is crucial (Kop & Hill, 2008).

In a connectivist framework, educators act as facilitators and guides rather than traditional instructors. They help learners develop the skills to navigate and build their own networks of knowledge. Technology plays a central role in connectivism. Online platforms, social media, and digital tools are integral to creating and maintaining connections. These technologies enable learners to access a wide array of resources and engage with diverse perspectives. Also, learning environments should be designed to foster connectivity. This includes creating opportunities for collaboration, encouraging the use of digital tools, and supporting the development of networks. Additionally, assessment in a connectivist approach focuses on the ability to connect and apply knowledge rather than rote memorization. Evaluations may include the ability to engage with networks, curate information, and contribute to communities of practice. This theory is particularly relevant to the current study, which explores the use of an online platform to support integrative learning in early childhood education.

Goldie (2016) highlights the significance of connectivism in the digital age, asserting that technology not only supports the acquisition of knowledge but also enhances the ability to apply and share this knowledge across various contexts. This aligns with the findings of Charles and Hill (2023), who argue that digital platforms can effectively support integrative learning by providing interactive and engaging resources. Similarly, Kropf (2013) views learning as a networked process, where knowledge is constructed through interactions within digital environments.

The benefits of integrative learning are well-documented in the literature. Durrant and Hartman (2015) emphasize that integrative learning fosters curiosity, critical thinking, and problem-solving skills in young children. By connecting different subjects, students can see the relevance of their learning in real-world contexts, which enhances their motivation and engagement. Newell (2010) also highlights the challenges teachers face in implementing integrative learning, such as a lack of awareness, insufficient time for preparation, and resistance to reducing traditional lecture content. Despite these challenges, the potential benefits of integrative learning make it a valuable approach in early childhood education.

The use of technology to facilitate integrative learning is supported by numerous studies. Rosenfeld and Martinez-Pons (2005) emphasize that technology provides instant access to information, making it an essential tool in modern classrooms. Students are already familiar with digital tools like iPads, smartphones, and computers, and leveraging these tools for educational purposes can enhance learning outcomes. Goddard (2002) and Bannan (2009) suggest that virtual classrooms, websites, and other forms of educational technology can engage students actively and provide teachers with additional resources to enhance their teaching.

Huber, Hutchings, and Gale (2005) define integrative learning as the ability to make connections between different ideas, thoughts, and experiences. They argue that this approach enables students to apply knowledge to various life experiences, fostering creative ideas and problem-solving skills. The use of technology in integrative learning aligns with this definition, as digital platforms provide diverse resources and facilitate connections between different knowledge areas.

Despite the extensive research on integrative learning and the use of technology in education, there is a noticeable gap in studies focusing specifically on the contribution of technology to integrative learning at the kindergarten level, particularly in the Middle East. Most existing research targets higher education and general educational contexts. Inspired by recent studies on digital education in the Gulf (El Haddad & Charles, 2024; Shehzad & Charles, 2023), this study addresses this gap by exploring the role of a dedicated educational website in facilitating integrative learning in kindergarten settings. This research provides insights into the challenges and opportunities of using technology to support integrative learning in early childhood education within the UAE context.

Further research is needed to explore the long-term impact of digital platforms on integrative learning and to identify the most effective technological solutions for early childhood education. Comparative studies evaluating different types of digital tools, such as mobile apps, virtual reality environments, and interactive whiteboards, could provide deeper insights into their effectiveness in facilitating integrative learning. Additionally, future studies should examine the direct impact of digital platforms on student outcomes, including cognitive, social, and emotional development.

In conclusion, the existing literature highlights the potential of integrative learning and the role of technology in enhancing this approach. However, there is a need for more research focused on early childhood education and the specific contributions of digital platforms to integrative learning in diverse cultural contexts. By addressing these gaps, future research can provide valuable insights for educators and policymakers, ultimately enhancing teaching and learning practices in early childhood education.

Methodology

This study adopts a pragmatic research paradigm, which combines both quantitative and qualitative approaches to gain a comprehensive understanding of the research problem. The pragmatic paradigm is appropriate for this study as it allows for the use of multiple methods, viewpoints, and data sources to answer the research questions effectively.

The research design of this study is a mixed-methods approach, combining quantitative and qualitative methodologies to explore the impact of an interactive online website on kindergarten teachers' implementation of integrated learning. The quantitative aspect involved a post-evaluation survey to gather numerical data, while the qualitative aspect included open-ended survey questions to collect in-depth insights from the participants. This combination provides a holistic view of the research problem and enhances the validity and reliability of the findings.

The research population consisted of kindergarten teachers from Al Ain, UAE. Purposeful sampling was employed to select participants who were knowledgeable and experienced in the research topic. The sample initially targeted 60 teachers; however, responses were obtained from 37 participants. The participants were all female, aged between 20-40 years, with varying levels of experience and education. This demographic was chosen due to the specific focus on kindergarten teachers in this region.

The primary data collection instrument was an online survey administered via Survey Monkey. The survey included multiple-choice questions, Likert scale items, and open-ended questions. The survey was designed to gather demographic information, assess the ease of use and relevance of the website, and collect qualitative feedback on the participants' experiences and suggestions for improvement. The survey was distributed via email, and the responses were manually entered and analyzed using Microsoft Excel.

Ensuring the validity and reliability of the research instruments was a priority. Validity refers to the accuracy of the measures used, ensuring that the survey questions accurately reflect the research objectives (Heale & Twycross, 2015). Reliability, on the other hand, pertains to the consistency of the results when the research is repeated under similar conditions (Kimberlin & Winterstein, 2008). The purposeful sampling of experienced kindergarten teachers contributed to the validity and reliability of the data. Additionally, the survey instrument was pre-tested with a small group of teachers to ensure clarity and relevance, and minor adjustments were made based on their feedback. The data analysis involved graphical representations such as pie charts and bar graphs to provide clear and accurate insights.

Ethical considerations were rigorously observed throughout the research process. Approval was obtained from the principal of the kindergarten school where the study was conducted. A consent form detailing the research objectives, the role of the participants, and the confidentiality of their responses was provided to all participants. Participants were required to sign the consent form to indicate their willingness to participate. Anonymity and confidentiality were maintained, and participants were assured that their

responses would be used solely for research purposes. The ethical guidelines outlined by the British Educational Research Association (BERA) were strictly followed to ensure the integrity and ethical conduct of the research.

The research procedure began with the development of a prototype website using Wix.com. The website featured resources categorized under four main themes: Going back to School, Humans and Animals, Growing in the Garden, and UAE My Country. These resources were designed to integrate the subjects of English, Mathematics, and Science through games, videos, interactive learning activities, coloring fun activities, and songs. The website was developed following the Successive Approximation Model (SAM), which provides guidelines for creating eLearning portals (Jung et al., 2019).

After the website's development, an email was sent to the selected kindergarten teachers, inviting them to participate in the study by using the website and completing the survey. The survey included ten questions, four of which gathered demographic information, while the remaining six assessed the website's usability, relevance, and effectiveness in facilitating integrative learning. The responses were collected and analyzed to draw conclusions about the impact of the website on teachers' implementation of integrated learning.

Findings

The data collected from the post-evaluation survey provided valuable insights into the impact of the interactive online website on kindergarten teachers' ability to implement integrated learning. The findings reveal both the strengths and areas for improvement of the website, aligning with existing literature on the use of technology in education.

The demographic profile of the participants consisted entirely of female kindergarten teachers, predominantly aged between 20-25 years, with 1-3 years of teaching experience. Most participants held undergraduate degrees, with a few having pursued postgraduate education. This demographic information is crucial for understanding the context and background of the respondents.
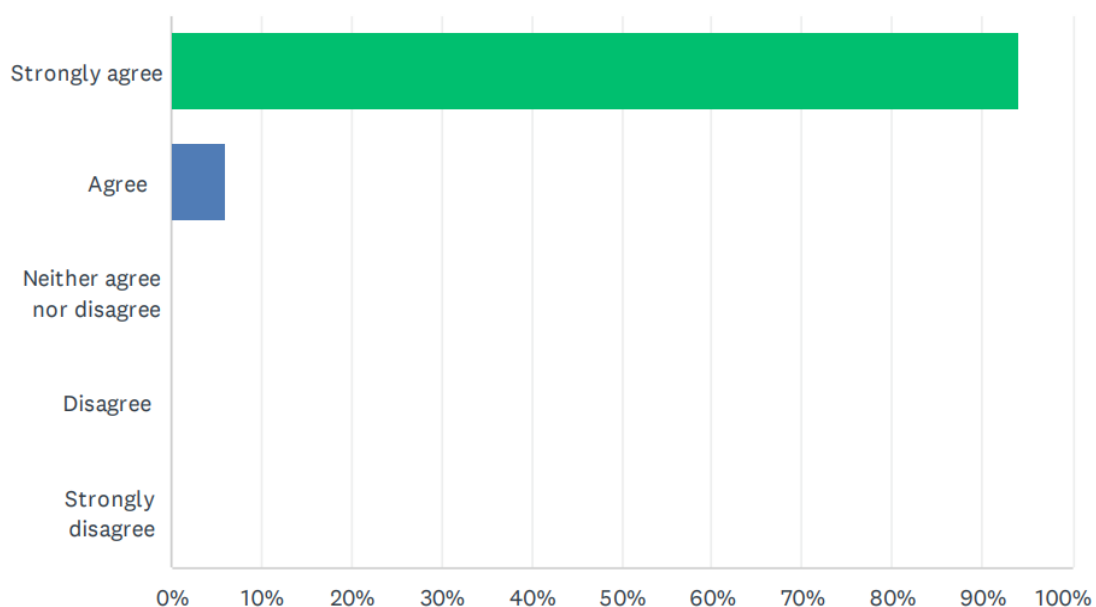
Usability and Navigation

Figure 1. Responses to the statement: "the website provided ample resources to integrate main lessons for English, Math and Science for the children".

A significant majority of the participants (94%) strongly agreed that the website provided ample resources to integrate the main lessons of English, Mathematics, and Science for the children. This high level of agreement indicates that the website was effective in supplying sufficient and relevant educational materials, which supports the findings of Bannan (2009) that technology can facilitate integrative learning by providing diverse and interactive resources.
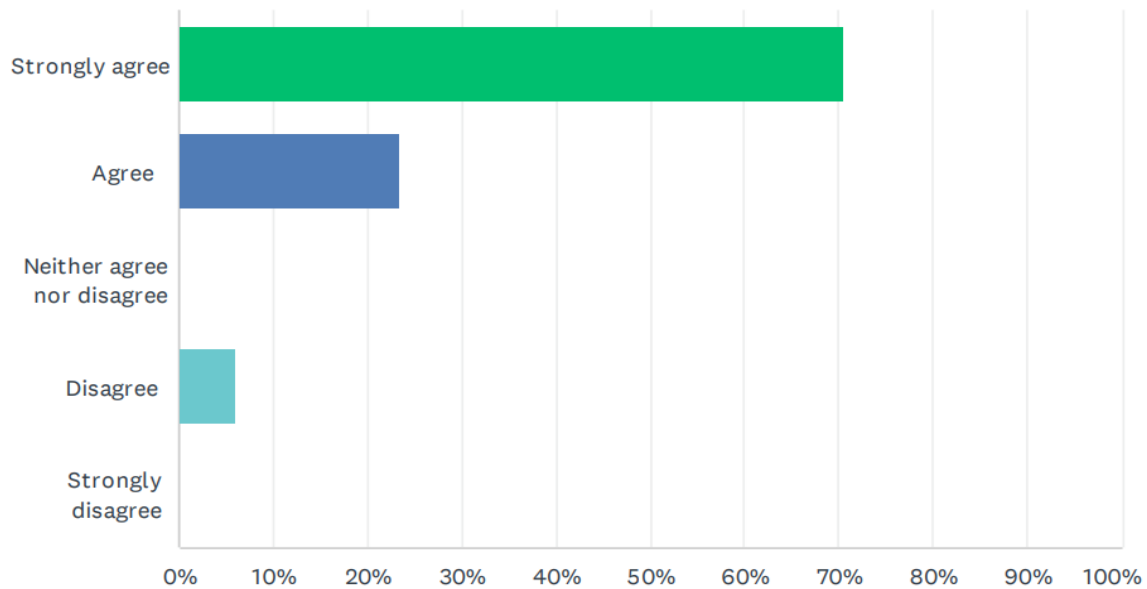

Figure 2. Responses to the statement: "the website was very easy to navigate and use".

Additionally, 71% of the participants strongly agreed that the website was very easy to use and navigate. This finding underscores the importance of user-friendly design in educational technology, as emphasized by Rosenfeld and Martinez-Pons (2005), who noted that technology must be accessible and straightforward to benefit teachers and students.

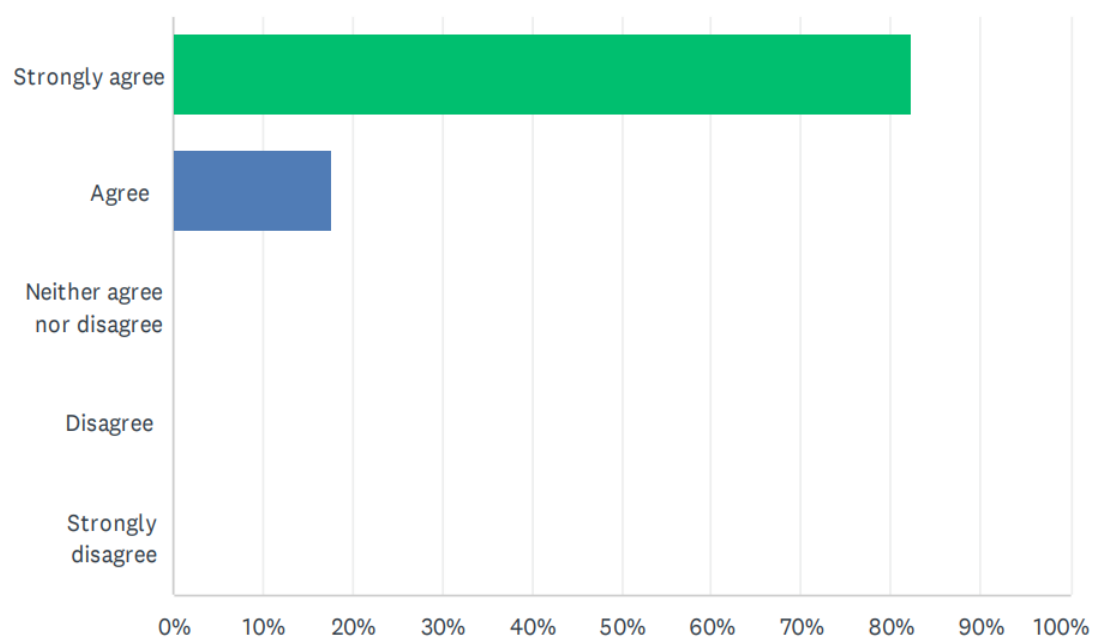*Relevance and Applicability of Resources*

Figure 3. Responses to the statement: "the resources provided on the website were relevant and applicable in the classroom".

The survey results showed that 82% of the respondents strongly agreed that the resources provided on the website were relevant and applicable in the classroom. This aligns with Goldie (2016), who highlighted the significance of integrating technology with learning to enhance the applicability of educational materials. The positive feedback on the relevance of the resources suggests that the website successfully addressed the specific needs of kindergarten teachers, providing materials that were directly applicable to their teaching contexts.

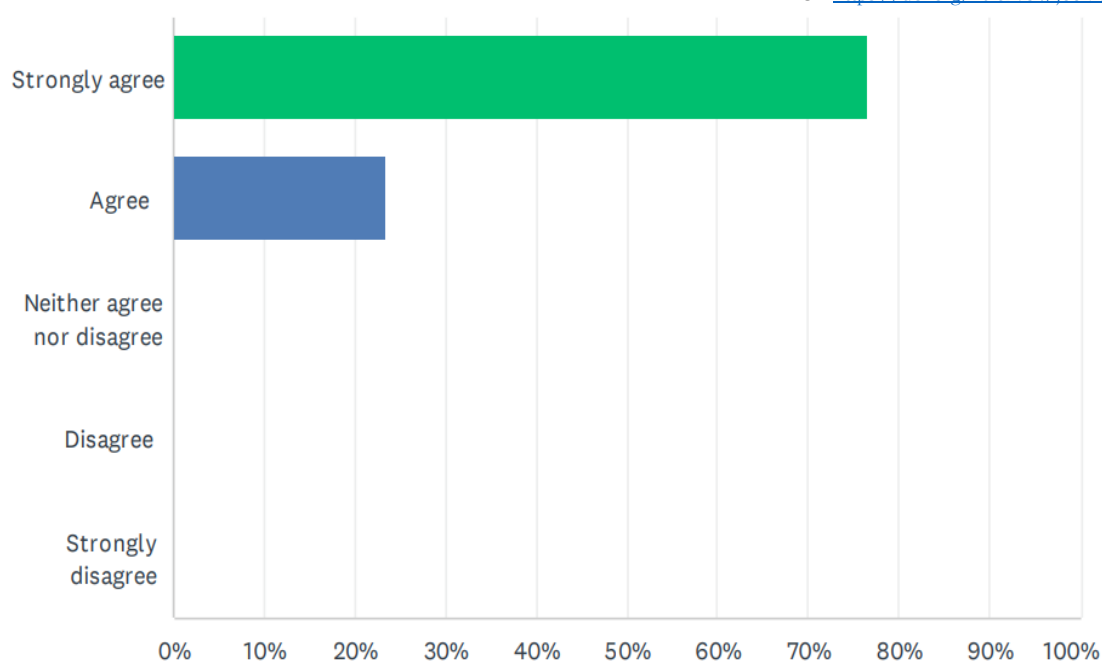*Effectiveness in Facilitating Integrative Learning*

Figure 4. Responses to the statement: "using the website helped me integrate different lessons for the children more effectively".

Seventy-seven percent of the participants strongly agreed that using the website helped them integrate different lessons for the children more effectively. This finding is consistent with the concept of connectivism, which advocates for the use of digital technology to facilitate learning by making connections between different knowledge areas (Siemens, 2004; Downes, 2008). The teachers' ability to integrate lessons more effectively using the website demonstrates the practical application of connectivism in early childhood education.

The qualitative feedback from the open-ended survey questions provided additional insights into the teachers' experiences with the website. Many participants praised the website's design, ease of navigation, and the availability of resources. One teacher mentioned the effectiveness of the "UAE My Country" theme in integrating the three subjects, which highlights the cultural relevance and contextual applicability of the resources provided.

However, some teachers suggested areas for improvement, such as enabling live community and sharing features, allowing teachers to upload their own resources, and continuously updating the website with new materials. These suggestions align with the findings of Huber, Hutchings, and Gale (2005), who emphasized the need for continuous improvement and adaptation of educational resources to meet evolving educational demands.

Discussion

The findings from this study underscore the potential of an interactive online website to significantly enhance integrative learning in kindergarten classrooms. The positive feedback on the website's usability, relevance, and effectiveness demonstrates that digital platforms can play a crucial role in supporting teachers' efforts to implement integrative learning strategies. This is particularly important in early

childhood education, where the integration of subjects can foster critical thinking, creativity, and problem-solving skills in young learners (Durrant & Hartman, 2015).

One of the key strengths of the website, as highlighted by the participants, is its user-friendly design. Ease of navigation is crucial for educational technology, as it ensures that teachers can quickly and efficiently access the resources they need without encountering technical difficulties (Rosenfeld & Martinez-Pons, 2005). The high percentage of teachers who found the website easy to use suggests that the design considerations were well-implemented, facilitating a seamless user experience.

The relevance and applicability of the resources provided on the website were also praised by the participants. The inclusion of culturally relevant themes, such as "UAE My Country," not only made the resources more engaging for the students but also helped teachers integrate local context into their lessons. This approach aligns with Goldie's (2016) emphasis on the importance of contextual relevance in educational resources. By providing materials that are both meaningful and applicable, the website supports teachers in creating a more integrated and cohesive learning experience for their students.

Furthermore, the study's findings align with the principles of connectivism, which advocate for the use of digital technology to facilitate learning by making connections between different knowledge areas (Siemens, 2004; Downes, 2008). The website's ability to help teachers integrate lessons more effectively demonstrates how digital tools can be leveraged to enhance integrative learning. By accessing a centralized platform with diverse resources, teachers can create more dynamic and interconnected lessons, thereby fostering a deeper understanding of the material among their students.

However, the qualitative feedback also highlighted several areas for improvement. Participants suggested the addition of features that would allow for greater collaboration and resource sharing among teachers. This aligns with the findings of Huber, Hutchings, and Gale (2005), who emphasized the need for educational resources to be adaptable and continuously improved. By incorporating a live community and sharing features, the website could facilitate a more collaborative learning environment where teachers can exchange ideas, resources, and best practices. This would not only enhance the quality of the resources available but also foster a sense of community and professional support among teachers.

Additionally, the suggestion to continuously update the website with new materials is critical for maintaining its relevance and effectiveness. Educational standards and practices are constantly evolving, and it is essential for digital platforms to keep pace with these changes. Regular updates to the resources can ensure that the website remains a valuable tool for teachers, providing them with the most current and effective materials for integrative learning.

The findings also suggest that while the website was effective in providing resources for integrating English, Mathematics, and Science, there is potential for expanding its scope to include other subjects and interdisciplinary themes. Future iterations of the website could incorporate resources for social studies, arts, and physical education, thereby offering a more comprehensive tool for integrative learning. This would align with the broader educational goal of fostering holistic development in young learners.

In addition to expanding the scope of the website, future research should also explore the impact of different types of digital platforms on integrative learning. Comparative studies could evaluate the effectiveness of various technological tools, such as mobile apps, virtual reality (VR) environments, and interactive whiteboards, in facilitating integrative learning. This would provide deeper insights into the most effective technological solutions for early childhood education and help educators and policymakers make informed decisions about the adoption of digital tools in the classroom.

Moreover, it is important to consider the broader implications of integrating technology into early childhood education. While digital platforms can provide valuable resources and support for teachers, it is also essential to ensure that these tools are used in a way that complements, rather than replaces, traditional

teaching methods. Blended learning approaches, which combine digital resources with face-to-face instruction, can offer a balanced and effective way to integrate technology into the classroom (Graham, 2006). By combining the strengths of both digital and traditional teaching methods, educators can create a more dynamic and engaging learning environment for young students.

In conclusion, this study highlights the significant potential of an interactive online website to support kindergarten teachers in implementing integrative learning. The positive feedback on the website's usability, relevance, and effectiveness underscores the importance of user-friendly design and culturally relevant resources in educational technology. However, there is also a need for continuous improvement and adaptation of digital platforms to meet the evolving needs of teachers and students. By addressing the identified limitations and pursuing suggested avenues for future research, educators and policymakers can further optimize the use of digital platforms to enhance teaching and learning in early childhood education.

Conclusion

This study aimed to explore the impact of an interactive online website on enhancing kindergarten teachers' capabilities in implementing integrated learning in their classrooms. The findings indicate that the website was successful in aiding teachers to implement integrated learning, with a significant majority reporting the utility of the resources in effectively integrating subjects. Teachers found the website easy to navigate and the materials relevant and applicable to classroom settings. These results underscore the potential of technology, particularly educational websites, in supporting integrated learning initiatives in early childhood education.

The development and deployment of a dedicated website provided kindergarten teachers with valuable resources and tools to facilitate integrative learning. The positive feedback from teachers highlights the importance of user-friendly, accessible digital platforms in enhancing educational outcomes. The study suggests that investing in digital platforms that offer accessible, relevant, and engaging educational resources can significantly benefit educators and students alike.

Despite the positive findings, this study faced several limitations. The sample size was relatively small, with only 37 participants, which may not fully represent the broader population of kindergarten teachers. Additionally, the study was conducted within a specific geographic region (Al Ain, UAE), limiting the generalizability of the findings to other regions or contexts. The limited time frame for data collection also posed a challenge, as it restricted the ability to gather more comprehensive insights from the participants. Furthermore, some teachers were reluctant to use the website and apply the resources in their classrooms, which could have affected the overall results.

Future research should address these limitations and build on the findings of this study. Several avenues for future research include (a) expanding the sample size and including teachers from different regions and backgrounds would provide more comprehensive and generalizable results. This would help in understanding the broader applicability of the website in diverse educational settings. (b) Conducting longitudinal studies would allow researchers to assess the long-term impact of using the website on teachers' implementation of integrated learning. This would provide insights into how sustained use of digital platforms influences teaching practices and student outcomes over time. (c) Future studies could investigate the effectiveness of additional features suggested by the participants, such as live community and sharing features, teacher-generated resources, continuous updates, and lesson plan templates. Assessing the impact of these features would help in refining and enhancing the website to better meet teachers' needs. (d) Comparing the effectiveness of different types of digital platforms (e.g., websites, mobile apps, virtual reality tools) in facilitating integrative learning would provide valuable insights into the most effective technological solutions for early childhood education. (e) While this study focused on teachers' perspectives, future research should examine the direct impact of integrative learning facilitated by digital platforms on student outcomes. This includes assessing improvements in students' cognitive, social, and emotional development resulting from integrative learning approaches. (f) Investigating the use of digital platforms for integrative learning in different cultural contexts would provide a deeper understanding of how cultural

factors influence the adoption and effectiveness of technology in education. This would help in designing culturally sensitive educational tools that cater to diverse student populations.

In conclusion, this study contributes to the growing body of literature on the role of technology in education by demonstrating the potential of an interactive online website to enhance integrated learning in kindergarten settings. By addressing the identified limitations and pursuing the suggested avenues for future research, educators and policymakers can further optimize the use of digital platforms to support effective teaching and learning practices in early childhood education.

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