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Development And Validation of An Educational Website On Teaching Materials To Enhance Preschool Teachers' Teaching Skills in Digital Era

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Abstract

Preschool teachers in Mogadishu, Somalia, face significant challenges due to limited access to quality and relevant teaching materials, hindering effective instruction and early childhood development. This study addresses the issue by developing an educational website aimed at enhancing teaching skills. Using the Research and Development (R&D) method with the ADDIE model, the study focused on the design and development phases. Validation data were obtained from three educational technology experts and three material experts via validation forms assessing components such as e-books, assessment tools, and teaching tips. Teaching materials were evaluated based on quality, usability, functionality, and educational content. Material experts rated the website at 4.3, classifying it as “very valid” and ready for use without revision. Media experts rated the site 4.1, suggesting minor grammatical corrections and more engaging animations, which were implemented. Stage 2 validation confirmed the website’s readiness for classroom use. The study presents a validated, practical educational website tailored to the specific needs of preschool teachers in Mogadishu, serving as a platform to bridge the gap in teaching resources and support early childhood education effectively.

Keywords Addie Model, Educational Website, Expert Validation, Preschool, Teaching skills

Abstrak

Guru prasekolah di Mogadishu, Somalia, menghadapi tantangan besar akibat keterbatasan akses terhadap bahan ajar yang berkualitas dan relevan, yang menghambat efektivitas pengajaran dan perkembangan anak usia dini. Penelitian ini bertujuan mengatasi masalah tersebut dengan mengembangkan sebuah situs web edukatif untuk meningkatkan keterampilan mengajar guru prasekolah. Menggunakan metode Research and Development (R&D) dengan model ADDIE, penelitian difokuskan pada tahap desain dan pengembangan. Data validasi diperoleh dari tiga ahli teknologi pendidikan dan tiga ahli materi melalui formulir validasi yang menilai komponen seperti e-book, alat penilaian, dan tips keterampilan mengajar. Materi ajar dievaluasi berdasarkan kualitas, kegunaan, fungsionalitas, dan isi edukatif. Para ahli materi memberikan skor rata-rata 4,3 yang dikategorikan sebagai “sangat valid” dan siap digunakan tanpa revisi. Para ahli media memberi skor 4,1, dengan saran perbaikan tata bahasa dan penambahan animasi yang lebih menarik, yang kemudian diimplementasikan. Validasi tahap kedua mengonfirmasi kesiapan situs untuk digunakan di kelas. Studi ini menghadirkan situs web edukatif yang telah divalidasi dan dirancang khusus untuk kebutuhan guru prasekolah di Mogadishu, sebagai solusi terhadap kesenjangan sumber daya pengajaran dan dukungan pendidikan anak usia dini.

Kata Kunci: *Model ADDIE, Situs Web Edukasi, Validasi Ahli, Prasekolah, Keterampilan Mengajar*

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Introduction

The development of educational websites has emerged as an effective strategy to enhance teaching practices, particularly exploiting modern instructional design models such as ADDIE model. Incorporating features such as digital teaching materials, user-friendly navigation, and multimedia resources, in the websites aim to address gaps in resource accessibility and teacher training (Nichols & Greer, 2016). This approach modify with learner-cantered design concept, indicates usability and the specific needs of educators (Hasanah, And Martatiyana, 2023). Given its potential to enhance early learning outcomes and teacher preparedness, technology integration in preschool education is particularly important. Digital platforms have been shown to improve instructional practices by supporting teacher professional development and increasing resource availability. (Wan, 2023). In places like Mogadishu, Somalia, where issues like scarce resources and a lack of digital expertise greatly affect the effectiveness of instruction, such programs are essential. By developing a personalised educational website, this project seeks to give preschool teachers conveniently accessible, high-quality teaching resources that will ultimately enhance students' academic performance and teachers' instructional skills (Farisia & Syafi'i, 2024). Educational websites have become an effective tool for improving teachers' teaching abilities and offering easily available instructional materials. These websites present special chances for early childhood and preschool educators to include 21st-century skills and encourage digital citizenship in young learners, preparing them for a technologically advanced society (Alelaimat et al., 2020). Learning may become more relevant and adaptable to the current classroom by incorporating educational websites into lesson plans, for example, which can turn conventional teaching techniques into dynamic and captivating experiences. These websites include important facets of early childhood education, such as chances for individualised instruction, the advantages of having flexible access to resources, and overcoming barriers such a lack of digital skills and infrastructure issues (Khalaf, 2022).

Teachers benefit from the integration of instructional websites into early childhood education in a number of significant ways. Teachers can save time and yet give high-quality education by using the plethora of pre-made resources, lesson plans, and multimedia capabilities that these platforms offer (Cohen & Kalthoff, 2021). Through online training

modules, they provide professional development opportunities that allow teachers to advance their pedagogical approaches and digital literacy (Sheridan & Wen, 2021). Furthermore, by linking educators with a wider community, educational websites promote collaboration and allow them to exchange ideas and tactics, which enhances their instruction (Gragg & Collet, 2022). Similar to this, educational websites can be used to give preschool teachers a platform for professional development and ongoing learning, as well as lesson plans and carefully chosen resources that help them improve their teaching strategies (Wang & Guo, 2019). These websites help teachers create interesting and developmentally appropriate learning experiences by incorporating interactive multimedia technologies and flexible teaching resources, which encourages creativity in the classroom (Ilham et al., 2023). Additionally, these platforms' accessibility enables educators to remain update on innovative best practices strategies, which enhances teaching effectiveness (Wan, 2023).

The benefit of using educational websites on teaching materials go beyond the issues of convenience; they have been proven to improve the effectiveness of teaching and professional development for teachers (Sheridan & Wen, 2021). In the context of preschool education, the use of educational websites is a revolutionary solution that solves the existing problems of Somalia's education, such as the lack of access to quality and appropriate educational materials (Idris et al., 2024; Salad, 2022). With the support of the developed educational websites, preschool teachers can utilize the interactive, adaptive, and easily accessible teaching materials that can significantly change the process of preparing and presenting lessons, making them more interesting and developmentally appropriate for children (Longlong & Luen, 2023).

Studies indicates that educational websites can positively impact teachers' motivation, equipping them with diverse and cultural appropriate materials to provide various learner needs while enhancing pedagogical skills of educators (Otterborn et al., 2020). Furthermore, the adaptive nature of these platforms ensures that teachers can personalize teaching materials to align with individual student learning styles, ultimately fostering a more inclusive and effective educational environment (Familyarskaya, 2021). Preschool teachers in Mogadishu, Somalia, face several challenges in accessing updated and culturally relevant teaching materials, directly impacting their teaching skills. According to (Branch, 2009), performance discrepancies among educators are often due to a lack of resources, motivation, or knowledge and skills. In Somalia preschool teachers struggle with limited access to technological resources and adequate training, as pointed out by Hassan &

Abdullahi, (2021), many educators face significant barriers in utilizing online educational tools due to insufficient digital literacy. According to Familyarskaya, (2021), teaching materials in early childhood education is hindered by outdated equipment and inadequate institutional support. Additionally, in Somalia insufficient infrastructure and resource shortages further hinder teachers' ability to create a conducive learning environment (Gudeta et al., 2017). Lack of sufficient teaching and learning materials also limits the implementation of effective teaching strategies (Addow, 2023). These challenges and obstacles greeted by preschool teachers have significant negative reaction their teaching skills (Hosseinpour et al., 2015).

Teaching skills involve a different proficiency set essential for effective instruction. These include using strategic questioning to stimulate critical thinking, assessing student understanding, and encouraging active engagement. Teachers also need to be able to explain complicated concepts, reinforce learning, and use a variety of teaching strategies that are adapted to the needs of different cultural groups. For a learning experience to be unified, effective class opening and closing techniques are also essential (Darmadi, 2015). The lack of these skills is compounded by insufficient teacher training and support structures, further underscoring the need for professional development programs (Mligo, 2018). Efforts to address these gaps through digital resources can significantly enhance teaching quality (de Wit & Plastow, 2021).

An educational website is one type of electronic media that may be utilized as a teaching tool. To aid with the teaching and learning processes, a number of earlier research have created a variety of easily accessible instructional websites Kingsley, et. al, (2015), designed a web-based e-learning system tailored for preschool children, enabling an engaging and age-appropriate learning experience. Similarly, Arifin & Nugroho, (2023), created a website-based learning platform focusing on reading and numeracy for early elementary students, demonstrating its effectiveness in enhancing literacy and numeracy. Furthermore, Samsoedin & Suciati, (2023), explored the use of digital teaching materials for early childhood, showing how web-based platforms can integrate innovative teaching methods like the case method for a more immersive learning experience. Additionally, Huang et al., (2010), developed ICT-based e-learning teaching materials for early childhood education, emphasizing the role of technology in enhancing the accessibility and quality of educational content.

These studies collectively emphasized the potential of educational websites in creating engaging, interactive, and effective learning environments. Furthermore, online delivery systems can improve the quality of instruction, but they are frequently underutilised because of difficulties incorporating technology into classroom settings, according to Akram et al., (2022). Although there are studies on Somalia's use of technology, none have particularly examined how preschool teachers can use educational websites that provide specialised teaching resources. Thus, creating a specialised educational website with thorough and suitable preschool teaching resources can greatly improve instructors' abilities and close the existing gap. In order to maximise efforts to give teachers easily available, pertinent information, researchers are interested in creating educational websites on teaching materials (Nurhuda et al., 2024). Educational websites are platforms designed to meet the learning needs of educators, offering structured content to enhance instructional quality. In line with pedagogical best practices, educational websites designed specifically for early childhood educators allow teachers to find, modify, and successfully apply innovative teaching activities Cam & Çam, (2023). By using educational websites created for instructional materials, teachers can examine a variety of resources, concentrate on content that is suitable for their culture, and modify materials to fit the developmental phases of young students. Furthermore, Mardhatillah, (2021), emphasized that the use of digital media in the classroom promotes active participation in learning activities and increases teacher and student engagement.

However, accessing educational websites designed for instructional use can sometimes be challenging due to factors such as navigability, instructional design clarity, and cultural appropriateness. To address these challenges, this study developed educational website called "Bar-ama--baro" means teaching or learning), website, designed to provide preschool teachers with accessible teaching materials. The website offers a range of teaching material, emphasizing culturally relevant and the development of high-quality resources customized to the specific needs of preschool educators. This initiative aims to bridge gaps in resource accessibility and promote collaborative development among teachers. Thus, the main objective of this research is to develop an educational website on teaching materials. Therefore, the focus of this research problem is: What are the processes and results of developing educational website on teaching materials for preschool teachers that is feasible, based on the assessments of Media experts, material experts?

Method

This paper employed research and development method aimed to develop an innovative educational website for preschool education. According to (Borg & Gall, 1984), educational research and development involves designing new methods or tools based on research findings, which are then refined through field-testing and evaluation until they meet predetermined quality criteria. This iterative process is designed to improve existing products or methodologies by applying innovative procedures. For this research, the ADDIE development model—consisting of Analysis, Design, Development, Implementation, and Evaluation—served as the methodological framework (Branch, 2009). The research and development process was divided into three stages: the Preliminary Stage, which included the analysis phase to identify the needs of preschool educators; the Development Stage, focusing on the design and development of the educational website; and the Testing Stage, comprising implementation and evaluation to assess the website's feasibility, practicality, and effectiveness. This paper focuses on the development Stage, consisting the design and development phases that were undertaken to develop educational website.

Figure 1. ADDIE model (Branch, 2009)

Data Collection Instruments

The instruments used in this study were media validation sheets. The instruments consisted of validation sheets for educational technology experts, and material experts to measure the validity of the educational website. These validation sheets were designed to evaluate the construction, design, and content of the website to ensure it meets educational and usability standards. The instruments were reviewed and validated by expert professionals to ensure their reliability and accuracy in assessing the website's quality and effectiveness.

Meanwhile, the instruments for each validator were adapted from relevant research. For validation, media experts adopted the scale created by Ihmeideh, (2019), which aims to assess the validity and appropriateness of educational websites. The aspects of assessment include: Easy Navigation, Appropriateness of Content, Instructional Design, and Clarity, with indicators attached to each of these aspects. In the validation instrument, material experts adopted research adapted from Ngadiman, (2021),which includes aspects of Educational

Content, Functionality, Usability, and Quality, each accompanied by specific indicators for comprehensive evaluation. In this study the six expert professionals' gathered demographics are shown in Table 1.

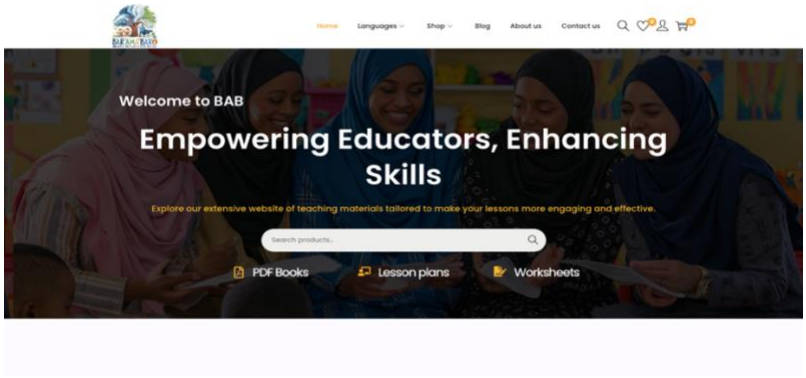
Table 1. Expert Demographic Analysis

No	Gender	Education Level	Field Specialization	Position
1	Female	PhD	Educational Technology-Media	Lecturer
2	Male	PhD	Educational Performance Technology	Lecturer
3	Male	PHD	Educational Technology	Lecturer
4	Female	PhD	Certified ECE Professional Expert	Lecturer
5	Female	Master	Somalia National Curriculum Expert	Teacher
6	Male	PHD	Curriculum and Education Expert	Lecturer

Design and Development

This phase focuses on developing the educational website by integrating multimedia elements and teaching resources. Researchers utilized WordPress for website development and Photoshop, Canva, and Microsoft Word for designing and organizing teaching materials based on preschool curricula. Key tasks include creating high-quality content, such as e-books, worksheets, lesson plans, and blog posts offering teaching tips, and integrating them into the website to ensure an engaging and user-friendly learning experience. The design of the interface, crucial for creating a positive first impression, is carefully aligned with the subject matter and learning objectives. The developed educational website components is presented in Table 2.

Table 2. Components and Website Design Phase Process

Component	Website Interface Design
Welcome Screen	

Product page
- Shop

Blog Page

Data Analysis Techniques

The data analysis in this study utilized both quantitative and qualitative approaches to assess the validity, practicality, and effectiveness of the educational website. The validation data collected, educational technology experts, and material experts were analyzed using a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Then the data was analyzed by calculating the average score for each aspect of the assessment using the following formula:

$$\text{Average Score} = \frac{\text{Total Assessment}}{\sum \text{Aspects Observed} \times \sum \text{Respondents}}$$

The quantitative data were converted into qualitative data categories such as Very Valid, Valid, Fairly Valid, Less Valid, or Not Valid, based on predetermined benchmarks. This step ensured a comprehensive of the website's quality, focusing on its construction, content, and usability.

Table 3. Convert values to product eligibility criteria

Average Score	Category	Decision
$4,2 \leq \overline{X} < 5$	Very Valid	Eligible
$3,4 \leq \overline{X} < 4,2$	Valid	
$2,6 \leq \overline{X} < 3,4$	Fairly valid	Eligible with Revision
$1,8 \leq \overline{X} < 2,6$	Less valid	
$1 < \overline{X} < 1,8$	Not Valid	Not Eligible

Furthermore, the eligibility and feasibility of the educational website on teaching materials were determined by applying the average score formula, where the total assessment score was divided by the product of the number of aspects observed and respondents. The resulting scores were categorized using a five-tier scale to evaluate the feasibility and quality of the educational website. In this study, materials with an average score above 3.4 were considered valid. This classification indicated the website was suitable and feasible for use in early childhood education.

Result and Discussion

The result of this research and development (R&D) was a product in the form of teaching materials integrated into an educational website focused on early childhood education. The research utilized the ADDIE model, which consists of five stages: analysis, design, development, implementation, and evaluation. However, the study was limited to the Development Phase, encompassing the design and development stages. During the product development process, the educational website underwent an expert validation stage to assess its feasibility and ensure its quality. The questionnaire, designed to assess the feasibility of the educational website, was distributed to each evaluator. The below Table 4 shows, the product assessment results by the material experts.

Table 4. Material expert validation result of the Material expert

No	Aspects	Average of Each Aspect	Decision
1	Educational Content	4.0	
2	Functionality	4.6	
3	Usability	4.2	**Eligible**
4	Quality	4.4	
	Total Average	**4.3**	

The results of the material experts' assessment of the educational website on teaching materials showed that the average rating score for all aspects is 4.3. Based on the validity criteria provided in Table 3, the educational website is categorized as "**Very valid**." In addition, all validators concluded that the teaching material the developed educational

website for early childhood education can be used without revision. The media expert assessment was conducted by three educational technology expert lecturers using an assessment sheet that evaluated four aspects: Easy to Navigation, Appropriateness of Content, Instructional Design, and Clarity. The results of the media expert validation for the developed educational website on teaching materials can be seen in Table 5.

Table 5. Media expert validation result of the Educational website

No	Aspects	Average of Each Aspect	Decision
1	Easy to Navigation	4.2	
2	Appropriateness of Content	4.3	
3	Instructional Design	4.0	**Eligible**
4	Clarity	4.0	
	Total Average	**4.1**	

Source : Ihmeideh, (2019), with modifications

Discussion

The media expert validation of the educational website yielded an average a total score of 4.1, categorizing it as "**Valid**." The indicators evaluated included Easy to Navigate, Appropriateness of Content, Instructional Design, and Clarity, all of which demonstrated a high level of effectiveness. Despite this positive assessment, the validators identified areas for improvement, such as correcting grammatical errors in the teaching skill tips and incorporating more engaging animations to better capture children's interest. These revisions were crucial for enhancing the overall quality and usability of the website. In response to the feedback, the researcher addressed the identified grammatical issues and integrated animations into the content. Additionally, a dedicated section for animation videos was created to support instructional use, allowing preschool teachers to utilize these resources during lessons to engage children more effectively. The stage 2 validation process, conducted via WhatsApp, confirmed that the suggested revisions were successfully implemented, and the validators affirmed that the website was now well-suited for implementation of teachers, meeting the standards established in the initial review.

The results of the study show that, with expert validation, the educational website on teaching materials has been deemed viable for incorporation into preschool learning activities. Thorough validation procedures show that it is appropriate for improving preschool teaching abilities. Through interactive and curriculum-aligned resources, web-based platforms have been shown to effectively improve teaching techniques and student engagement (X. Wu, 2024). Worksheets and e-books are among the resources that support the social, emotional, and literacy development of young children by being in line with the

standards of the early childhood curriculum (Shcherbakova & Dmitriev, 2022). Game-based learning applications and other interactive educational platforms enhance student engagement and developmental results (Laranjeiro, 2021). Material and media expert assessments of 4.3 and 4.1, respectively, confirmed the high viability and quality of the educational website created for instructors in Mogadishu using the ADDIE approach.

Media expert validation confirmed the website's design and development as valid, emphasizing its ease of navigation, appropriateness of content, instructional design, and clarity. Ihmeideh, (2019), used these aspects to determine the developmental appropriateness of children's websites which showed that evaluated website where developmentally appropriate in the domains of easy to navigate and technical design. The website's user-friendly navigation and consistent design enhance usability, ensuring that teachers can effectively access and integrate resources, supported by findings that clear and navigable online platforms significantly improve user satisfaction and teaching practices (Y. Huang et al., 2023). Additionally, the content was validated as appropriate for preschoolers, aligning with their developmental needs and curriculum standards, consistent with research demonstrating that tailored content in digital tools enhances engagement and learning outcomes in early childhood education (Wu et al., 2023). Furthermore, studies emphasize that platforms with well-structured content and usability features contribute significantly to improved teacher and learner engagement (Carrillo & Flores, 2020).

These findings point out that the website's potential as a valuable tool for preschool educators, supporting both educational goals and practical application in classroom settings. Although the results are promising, this study is limited to the development Phase. Future research should evaluate the website's real-world impact on enhancing teaching skills, as Nieminen et al., (2023), emphasized the importance of assessing digital tools in authentic contexts. Longitudinal studies could further explore sustained teacher engagement, as suggested by Mosquera, (2023), despite these limitations, the website aligns with research advocating for accessible, localized resources to enhance teaching in underserved regions, echoing the work of Josué et al., (2023), who emphasized technology's potential to bridge educational inequities. This innovation represents a meaningful step toward strengthening early childhood education through technology integration and tailored content delivery.

The integration of the educational website into early childhood education enhances instructional delivery and supports the development of educators' digital competencies,

which are essential in modern teaching (Shcherbakova & Dmitriev, 2022). Studies show that user-friendly, pedagogically aligned tools boost teacher confidence and effectiveness. Accessible digital resources also promote inclusive education in under-resourced areas (Y. Huang et al., 2023).. As validated in this study, platforms that are educationally sound and easy to navigate, like the one developed here, can be powerful tools for improving teaching practices and learning outcomes (Ihmeideh, 2019).

Conclusion

The educational website on teaching materials for preschool teachers has been successfully validated, showcasing its transformative potential in early childhood education. By integrating innovative design, user-friendly navigation, and developmentally appropriate content, the website enhances teaching abilities, aligns with curriculum standards, and fosters engaging learning experiences for preschoolers. The accessibility and functionality of the website empower teachers to seamlessly integrate technology into their lessons, meeting diverse teaching and learning needs. This not only improves pedagogical approaches but also opens new pathways for incorporating digital tools to enrich early childhood education. This study was limited to the development stage of the educational website. The effectiveness of the platform in improving preschool teaching skills has not been assessed, leaving a gap in understanding its practical impact on teaching skills. The results of the development of this instrument will serve as a foundation for further research on the website's effectiveness in enhancing preschool teachers teaching skills.

Suggestion

Future studies can examine the effectiveness of this educational website in improving preschool teachers' instructional skills. Research can assess its impact on lesson planning, classroom engagement, and the practical application of teaching strategies. Additionally, exploring user feedback and long-term adoption can help enhance the platform’s usability and relevance for preschool educators.

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