ETJ
(Educational Technology Journal)

Volume 05, Issue 2, October 2025, 26-37
ISSN 2979-2593 (Online)

https://journal.unesa.ac.id/index.php/etj

DEVELOPMENT OF WEBSITE-BASED LEARNING MEDIA IN TECHNOLOGY EXTRACURRICULAR LESSONS INFORMATION AND COMMUNICATION AT MUHAMMADIYAH MIDDLE SCHOOL TANJUNG SELOR

Sahid Setiawan[a], Lud Waluyo[b], Iis Siti Aisyah[c]
[a]Master of Pedagogy Study Program, Postgraduate Program, Universitas Muhammadiyah Malang, Malang, Indonesia
[b]Biology Education Study Program, Postgraduate Program, Universitas Muhammadiyah Malang, Malang, Indonesia
[c]Mechanical Engineering Study Program, Postgraduate Program, Universitas Muhammadiyah Malang, Malang, Indonesia

Correspondence: sahidsetiawan7@gmail.com

Abstract

This research aimed to develop a valid, practical, and effective website-based learning media to support Information and Communication Technology extracurricular activities at SMP Muhammadiyah Tanjung Selor. The study employed Research and Development methodology using the ADDIE model (Analyze, Design, Development, Implementation, Evaluation) with a purposive sampling technique involving 25 students participating in ICT extracurricular activities. Data collection was conducted through questionnaires, observations, interviews, and literature studies, while data analysis utilized descriptive qualitative and statistical descriptive techniques. The research results demonstrated that the developed website-based learning media achieved a material expert validation score of 77% (Good category) and a media expert validation score of 80% (Very Good category), indicating valid criteria. Student responses during implementation showed positive feedback with average percentages of 92.7% for the first meeting, 81.6% for the second meeting, and 85.3% for the third meeting, all categorized as Very Good. Teacher responses reached 90% (Very Good category), confirming the media's practicality. Effectiveness was proven through significant improvement in pre-test and post-test results, showing enhanced student understanding of ICT concepts, hardware-software identification, word processing applications, and digital design using Canva.

Keywords: *Website-Based Learning Media Ict Extracurricular; Addie Model; Digital Learning Innovation.*

Abstrak

Penelitian ini bertujuan mengembangkan media pembelajaran berbasis website yang valid, praktis, dan efektif untuk mendukung kegiatan ekstrakurikuler Teknologi Informasi dan Komunikasi di SMP Muhammadiyah Tanjung Selor. Penelitian menggunakan metode Research and Development dengan model ADDIE (Analyze, Design, Development, Implementation, Evaluation) dan teknik purposive sampling melibatkan 25 siswa peserta ekstrakurikuler TIK. Pengumpulan data dilakukan melalui angket, observasi, wawancara, dan studi literatur, sedangkan analisis data menggunakan teknik deskriptif kualitatif dan statistik deskriptif. Hasil penelitian menunjukkan bahwa media pembelajaran berbasis website yang dikembangkan memperoleh skor validasi ahli materi sebesar 77% (kategori Baik) dan skor validasi ahli media sebesar 80% (kategori Sangat Baik), menunjukkan kriteria valid. Respon siswa pada saat implementasi menunjukkan tanggapan positif dengan rerata persentase sebesar 92,7% pada pertemuan pertama, 81,6% pada pertemuan kedua, dan 85,3% pada pertemuan ketiga yang semuanya

berkategori Sangat Baik. Tanggapan guru mencapai 90% (kategori Sangat Baik), mengkonfirmasi kepraktisan media. Keefektifan terbukti melalui peningkatan signifikan hasil pre-test dan post-test yang menunjukkan peningkatan pemahaman siswa terhadap konsep TIK, identifikasi perangkat keras-lunak, aplikasi pengolah kata, dan desain digital menggunakan Canva.

Kata Kunci: Media Pembelajaran Berbasis Situs Web, TIK Ekstrakurikuler; Model Addie; Inovasi Pembelajaran Digital.

Introduction

Digital transformation in the world of education has presented a new paradigm in the implementation of learning, especially in extracurricular activities that aim to develop the potential of students holistically. Extracurricular activities as an integral part of the national education system have a strategic role in realizing the educational goals as mandated in Law Number 20 of 2003 Article 3 concerning the National Education System, namely developing the potential of students to become human beings who believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. In this context, extracurricular activities function as a forum for developing the potential of students through complementary intracurricular, co-curricular, and extracurricular activities. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 62 of 2014 concerning Extracurricular Activities in Primary and Secondary Education emphasizes that extracurricular activities have a vital function in discovering and developing the potential of students, providing significant social benefits in developing communication and cooperation skills, and facilitating the development of diverse talents, interests, and creativity of students. This shows that extracurricular activities are not just supplementary activities, but rather essential components in the formation of character and overall competence of students.

Recent research shows that participation in extracurricular activities has a significant positive impact on the holistic development of students. (Yahya & Amirzan, 2020) emphasizes that extracurricular activities are an important instrument for achieving educational goals, where extracurricular activities function not only as a means of entertainment, but as structured activities carried out outside of regular school hours with the aim of expanding students' knowledge, introducing various learning activities, channeling talents and interests, and complementing efforts to develop character as a whole. Furthermore, (Shilviana & Hamami, 2020) explain that learning in extracurricular activities is a learning process that occurs outside the main school curriculum, which not only focuses on the development of specific skills, but also on the personal, social, and emotional growth of students through diverse experiences outside the classroom, with guidance from the school to meet the needs of skill development in the cognitive, affective, and psychomotor domains.

In the era of the Industrial Revolution 4.0, developments in information and communication technology have fundamentally transformed the educational landscape. The integration of digital technology into the learning process has become an urgent need to prepare students for increasingly complex future challenges. This impacts not only formal classroom learning but also expands opportunities and enriches experiences in various extracurricular activities, particularly in the field of Information and Communication Technology. The use of learning media in this context is crucial to supporting the effectiveness and efficiency of achieving extracurricular learning objectives.

Learning media is defined as anything that can be used to convey messages, stimulate the thoughts, feelings, attention, and will of students so that it can encourage a meaningful learning process (Novitasari, Adrian, & Kurnia, 2021). The use of various types of learning media aims to improve learning experiences to be more concrete, so that learning outcomes become more meaningful for students (Saputra & Febriyanto, 2020). In the context of extracurricular learning in Information and Communication Technology, website-based learning

media offers a comprehensive solution to meet the needs for accessibility, flexibility, interactivity, and learning efficiency. Empirical research on the effectiveness of website-based learning media shows very positive results. Meduri, Firdaus, & Fitriawan (2022), in their research revealed that the use of interactive website media plays a significant role in increasing student motivation and interest in the learning process, with an increase in learning motivation of 3.5 percent due to the interactive nature of website learning media that can be used independently by students. Meanwhile, Amin et al. (2022) explained that website learning media can be developed with an attractive appearance, contain audiovisual content, and facilitate students to interact with various learning content, including materials, quizzes, and practice questions, so that learning becomes more effective and interactive.

Rijal & Jaya (2020) define website-based learning as various types of information on several computer servers interconnected in an internet network, while Karyati (2023) emphasizes that learning websites can increase student learning motivation because they can contain many features that can be utilized by students. The advantages of website-based learning media include easy-to-understand design and navigation displays, diverse interactive content, ease of access, and the ability to integrate various types of learning media in one integrated platform. Initial observations at Muhammadiyah Tanjung Selor Middle School indicate that this school has organized an extracurricular program in Information and Communication Technology with a frequency of two meetings per week. This program aims to equip students with relevant technological skills through learning graphic design and multimedia using software such as Adobe Photoshop and Canva, learning about computer hardware, and developing general digital skills, including digital literacy, productive use of the internet, the application of technology in everyday life, and ethics in using technology.

However, there is a gap between the potential of Information and Communication Technology (ICT) extracurricular programs and the implementation of learning media that optimally support the achievement of learning objectives. Comprehensive learning requires the support of learning media that can accommodate the needs for accessibility, flexibility, interactivity, and efficiency. Conventional learning media that have been used so far have not been able to meet the complex and diverse learning needs in accordance with the characteristics of ICT materials that require visual demonstrations, simulations, and direct practice. This gap includes limited access to learning materials outside of extracurricular hours, minimal interactivity in material delivery, limited media variety that can accommodate various student learning styles, and the suboptimal use of technology to support ICT extracurricular learning. This condition has the potential to hinder the achievement of established extracurricular learning objectives and is not in line with the latest developments in educational technology.

To address this gap, this research aims to develop website-based learning media that can support the delivery of material and improve students' skills in Information and Communication Technology extracurricular activities. The development of website-based learning media is expected to address the need for accessible, flexible, interactive, and efficient learning media, thereby making the learning process more engaging and meaningful for students. The contribution of this research is for the development of educational science includes the development of a website-based learning media model specifically for Information and Communication Technology extracurricular activities, providing alternative solutions to increase the effectiveness of extracurricular learning through the use of technology, and providing an empirical basis for the implementation of digital learning media in the context of formal education at the junior high school level.

Based on the background and gaps that have been described, this study formulates the main problem, namely, how to develop valid, practical, and effective website-based learning media to support Information and Communication Technology extracurricular activities at Muhammadiyah Tanjung Selor Junior High School. Specifically, this study aims to analyze the

description and level of need for website-based learning media development, design website-based learning media that are in accordance with the characteristics of Information and Communication Technology extracurricular learning, and measure the level of validity, practicality, and effectiveness of the developed learning media. Theoretically, the benefits of this research are expected to enrich the treasury of knowledge in the field of educational technology, especially the development of digital learning media for extracurricular activities. Practically, this research is expected to help students recognize and utilize Information and Communication Technology optimally, increase learning motivation, assist educators in using more interesting and interactive learning media, and become a recommendation material for improving the quality of learning and education in schools.

Research Methodology

This research is classified as a type of development research or Research and Development that adapts the ADDIE model developed by Lee, W.W., and Owens, D.L. (Rusdi, 2020). Seels & Richey (Nusa, 2020) define development research as "Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness". Based on this definition, development research is a systematic design study in developing and evaluating educational programs, processes, and products that meet the standards of internal consistency and effectiveness. The ADDIE model was chosen because it has easy-to-understand procedures and is suitable for the development of website-based learning media. This model provides a strong foundation for developing research with a foundation of phenomena that occur between expectations and gaps through fundamental problem identification to determine the next steps.

The research was conducted at Muhammadiyah Tanjung Selor Middle School, which is located in Bulungan Regency, North Kalimantan. The research began on August 12, 2024, focusing on the Information and Communication Technology extracurricular activities organized by the school. The target of this research is the development of website-based learning media to support the implementation of Information and Communication Technology extracurricular activities. The research subjects consisted of students participating in ICT extracurricular activities at Muhammadiyah Tanjung Selor Junior High School as the main research subjects. In addition, it involved ICT extracurricular teachers, material experts, and media experts as validators of the developed products. The research subject determination technique used a purposive sampling technique, where subjects were selected based on their characteristics and predetermined research objectives. The subject selection criteria included students who actively participate in ICT extracurricular activities, have basic skills in operating digital devices, and teachers who have competency in the field of information and communication technology. The research procedure followed the stages of the ADDIE model, which consists of five main phases:

Analysis stage: This stage includes literature studies and field studies to find references related to ICT extracurricular learning. Design stage: designing a website design by creating a storyboard containing an overall picture of interactive learning media as a guide for creating learning media. Development stage: Producing website media in accordance with the design plan that has been made about ICT extracurricular learning. Product validation consists of material validation by material experts and media validation by media experts. Product practicality testing is carried out through the implementation of validated learning media in the learning process by conducting small group trials and large group trials. Implementation stage: the website-based learning media that has been developed is tested in ICT extracurricular learning to determine the level of practicality and effectiveness of the product. Evaluation stage: testing the effectiveness of the website-based learning media that has been developed to see the influence of using the media as a learning medium in the implementation of ICT extracurricular activities.

The data obtained in this study are grouped into qualitative and quantitative data. Qualitative data were obtained through questionnaire responses from media expert reviews, material expert reviews, educator reviews on ICT extracurricular activities, and student responses in the form of criticism and suggestions on the developed learning tools. Quantitative data were obtained from the accumulated values converted with a scale of 5 and the average achievement level of the presentation of the questionnaire responses from material expert reviews, media experts, extracurricular teachers, and user responses. The data collection instrument used a questionnaire containing written questions to material experts, media experts, educators, and students to obtain the necessary answers, responses, and information. The questionnaires created were a product feasibility questionnaire for material experts and media experts, a questionnaire of extracurricular teachers' responses to the developed product, and a questionnaire of students' responses before and after learning the developed product.

Data collection techniques are carried out in several techniques, namely (1) Literature study: Carried out by searching for concepts and theoretical foundations related to website development as a learning medium to deepen the researcher's knowledge and understanding of the process of developing learning media in ICT extracurricular activities. (2) Observation: Researchers directly observe the learning process in the field to analyze the needs that are used as initial material for developing a website as a learning medium. Observations are carried out before and during the product trial to obtain initial data in the form of school environmental conditions, needs analysis, characteristics of educators and students, and learning tools available at the school. (3) Questionnaire: Data collection techniques in the form of questionnaires are carried out during problem identification, needs analysis, product trials, and after product demonstrations. Media validation questionnaires are given to media experts and material experts, educator response questionnaires are given to ICT extracurricular teachers, and student response questionnaires are distributed during the initial needs analysis and after participating in the product trial. (4) Interviews: Using unstructured interviews where researchers do not use systematic and complete interview guidelines for data collection. Interviews were conducted during initial observations regarding the ICT extracurricular learning process and learning about ICT taught in schools.

Data analysis was conducted during and after data collection using descriptive analysis, which aims to provide a description of the research subjects based on the data obtained. This study used two data analysis techniques:

1. **Qualitative descriptive analysis**

Used to process data from reviews of ICT extracurricular materials and media by grouping information from qualitative data in the form of input, responses, criticism, and suggestions for improvement contained in the questionnaire. The results of the data analysis are then examined and selected as a reference for product improvement.

2. **Descriptive statistical analysis**

Used to process data obtained through questionnaires in descriptive form from questionnaires on needs, responses from subject matter and media experts, responses from ICT extracurricular participants, and ICT extracurricular teachers, which are presented in the form of scores. The results of the data analysis were used to determine the feasibility, practicality, and effectiveness of the website-based learning media developed to support the implementation of Information and Communication Technology extracurricular activities at SMP Muhammadiyah Tanjung Selor. The data obtained in this study were grouped into qualitative and quantitative data. Qualitative data was obtained through questionnaires on the responses of media experts, subject matter experts, educators in ICT extracurricular activities, and students in the form of criticism and suggestions on the learning tools developed. Quantitative data was obtained from the accumulated scores converted to a 5-point scale and the average achievement level from the

response questionnaires of material experts, media experts, extracurricular teachers, and user responses.

Research Findings and Discussion

The development of website-based learning media in the Information and Communication Technology extracurricular at Muhammadiyah Tanjung Selor Middle School was carried out using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation.

Based on a needs questionnaire completed by 25 students, it was found that most had never used website-based learning media before. However, all students agreed with the development of learning media to support extracurricular ICT learning. Most students also stated that ICT learning has not been fully supported by engaging teaching materials and media, especially in digital and interactive formats. This indicates a significant need for the development of adaptive technology-based media.

Table 1. Summary of Learning Media Needs Identification Results

Question Indicators	Number of answers obtained		
	Yes	Occasionally	No
Is informatics learning supported by the use of teaching materials?	6	19	0
Is ICT extracurricular learning supported by the use of learning media?	6	19	0
Do you enjoy studying informatics?	17	8	0
When delivering theoretical material in class, do you always pay close attention to what the teacher is saying?	7	18	0
Are you always enthusiastic about participating in practical learning?	12	13	0
Do you like the teacher's delivery during the learning process?	8	17	0
Is the extracurricular ICT learning process not only about the material but also teaching the material and values contained in the learning material being taught?	4	5	16
Have you ever studied using learning media websites?	0	2	19
Are you studying Information and Communication Technology?	25	0	0
Do you agree if learning media regarding Information and Communication Technology are developed?	25	0	0

Media Validation by Experts

Validity assessment was conducted by two experts: a material expert and a media expert. The material expert's validation obtained a score of 77% (Good category), while the media expert's validation obtained a score of 80% (Very Good category). This indicates that the learning media product is suitable for use at the implementation stage without the need for significant revisions. The learning media was assessed as being able to explain ICT material clearly, interestingly, and in accordance with student characteristics. Aspects assessed included content clarity, narrative flow, appropriate use of audio-visuals, and the potential to increase student interest and participation.

Figure 1. Example of the Canva Website Learning Media Interface

Table 2. Assessment Results by Content Experts

No	*Rated aspects*	*Score*
1	The suitability of the material presented with basic competencies	4
2	The suitability of the story to the learning objectives to be achieved	4
3	Relevance of material to student characteristics	4
4	The suitability of the material presented with scientific truth	4
5	The scenario sequence is clear and easy to follow.	4
6	The clarity of the video delivered	4
7	The interestingness of stories in learning	4
8	This learning can be used in the learning process.	4
9	The learning is easy to use	4
10	The language used in learning is easy to understand	4
11	Encourage students' curiosity	4
12	Encourage students to construct their own knowledge	3
13	Encourage students to learn independently	3
14	This learning can motivate students to pay attention to learning messages.	4
	Total	54

Implementation and Evaluation of Learning Media

The learning media trial was conducted in three extracurricular meetings. Student responses to the developed media showed an average positive response across all indicators. The first meeting achieved an average percentage of 92.7%, the second meeting 81.6%, and the third meeting 85.3%. This means that all implementations were in the very good category.

Product effectiveness was measured through student pre- and post-test results. Pre-test results indicated a low mastery of basic ICT concepts, such as hardware and software identification, word processing application operation, and design skills using Canva. After using the learning media, there was a significant improvement in post-test results. Students demonstrated a better understanding of technology components, internet functions, and digital media design.

Teachers' Responses to Learning Media

Subject teachers gave positive responses to the media developed, with an achievement percentage of**90%**(Very Good category). This media is considered effective in supporting the achievement of learning objectives and is able to adapt to the characteristics and learning environment of students at Muhammadiyah Tanjung Selor Middle School. The results of the study indicate that the developed website-based learning media has met the aspects of validity, practicality, and effectiveness. This media not only increases students' interest and motivation to learn but also has a positive impact on learning outcomes and student understanding in the field of Information and Communication Technology.

The final results

The development of website-based learning media in the Information and Communication Technology (ICT) extracurricular program has shown significant results in improving the quality of learning. The findings of this study provide a new contribution to the use of digital technology as a learning medium that functions not only as a conveyor of information but also as a facilitator of more dynamic learning interactions. The developed website-based learning media has substantial significance as an educational technology innovation that integrates visual, audio, and interactive aspects in a single platform. Unlike research (Larisu, Irwansyah, & Djuhardi, 2022) that utilizes learning as an alternative medium with a focus on Islamic values and the education of children with special needs, this study develops learning media specifically designed for the characteristics of junior high school students, using an engaging game and quiz approach. The advantage of this website-based learning media lies in its accessibility, which students can use anytime and anywhere, thereby increasing learning flexibility. This aligns with the opinion of the Association of Education and Communication Technology (AECT) in (Fikri & Madonna, 2020), which states that learning media is a medium for conveying messages in a more engaging, easy, and interactive way. However, this research provides a new dimension by integrating a website platform that allows for both self-directed and collaborative learning simultaneously.

The validation results of the learning media indicate a valid category based on the assessments of media experts and subject matter experts. This validity is not limited to technical aspects but also includes the suitability of the learning content to basic competencies and learning objectives. The principle of relevance proposed by Rusman et al., 2020, regarding the suitability of learning media to objectives, subject matter characteristics, student potential and development, and available time, has been met in the development of this media. This finding differs from the research of Nugrahensy and Mariono (2021), which focused solely on learning accessibility in informatics subjects. This research further develops it by considering the characteristics of junior high school students who prefer practical and interactive activities, so that the learning media is designed with a more engaging approach through educational games and quizzes. A unique aspect of this research is the development of media that not only meets

scientific standards but is also adapted to the student environment at Muhammadiyah Tanjung Selor Junior High School, which has an Information and Communication Technology extracurricular activity. This demonstrates a contextualization of learning media not found in previous research.

The practicality of website-based learning media has been proven to stimulate the senses of sight and hearing simultaneously, thus focusing students' attention as a medium that helps convey learning messages more engagingly. Unlike conventional approaches that still rely on lecture methods, this media provides interactive learning content in the form of modules, video tutorials, quizzes, and discussion forums. The criteria for selecting appropriate learning media, according to Setyosari (Zahwa & Syafi'i, 2022), include understanding the material with the appropriateness of the media used, ease of presentation, and good technical quality, all of which have been met in the development of this media. A distinguishing advantage of this research is the use of the Canva website and the Filmora Pro video editor application, which allow access via devices and laptops, providing greater flexibility than conventional learning media. This learning media also supports collaboration between students through group projects and online discussions, where students are invited to work together to create digital content such as presentations, infographics, and videos that can be published on the website platform. This collaborative aspect is an innovation not found in previous similar research, thus making a new contribution to the development of 21st-century skills.

The effectiveness of using website-based learning media is proven by the increase in student learning interest and learning outcomes, as measured by pre- and post-test questionnaires. These findings support the statement (Mannan, Wulandari, Romadhoni, & Fitriyah, 2023) that the use of audio-visual media to increase student learning interest shows positive results, with indicators of enjoyment, engagement in learning, interest, and attention in listening to the media or material provided. However, this study provides a new dimension by showing that website-based learning media not only increases learning interest but also develops digital literacy skills, problem-solving, and the ability to adapt to constantly changing technology. This is a significant contribution in preparing students to face the challenges of the digital world. The fundamental difference from previous research lies in the teacher's changing role from a knowledge provider to a learning facilitator, coach, collaborator, knowledge navigator, and learning partner, as stated (Febriati, 2022). Website-based learning media facilitates this role transformation by providing a platform that enables both independent learning and focused guidance.

This research contributes to innovation in technology learning through the integration of websites as a learning platform that combines cognitive, affective, and psychomotor aspects. Unlike previous research that tends to focus on one aspect, this learning medium develops a holistic approach that enables students not only to understand Information and Communication Technology concepts but also to apply them in real-world contexts. The main advantage of this learning medium is its ability to overcome the limitations of conventional learning, which often leaves students bored due to its reliance on verbal explanations without adequate visualization. Website-based learning media provides a diverse and varied learning experience, thereby further stimulating student interest in learning, in line with the objectives of learning media stated by Sumantri (Fikri & Madonna, 2020). The aspect of learning continuity is also a strength of this medium, where students can access materials anytime and anywhere, enabling learning at their own pace. This creates a culture of independent learning that is not limited to a specific time and place, contributing to the development of lifelong learning character.

The findings of this study have theoretical implications for the development of learning media theory that integrates digital technology with a student-centered pedagogical approach.

Website-based learning media not only functions as a tool, but also as an active mediator that facilitates students' knowledge construction through interaction with systematically designed digital content. Practically, this study provides a model for developing learning media that can be adapted for other subjects by considering student characteristics, learning materials, and the learning environment. This model shows that technology integration in learning requires careful planning, not just the digitization of conventional materials, but the reconstruction of meaningful learning experiences. The limitation of this study lies in the measurement of effectiveness which only uses pre-test and post-test questionnaires. Therefore, further research can develop more comprehensive measurement instruments to assess the long-term impact of website-based learning media on the understanding and mastery of Information and Communication Technology.

Conclusions and Recommendations

The development of website-based learning media for the Information and Communication Technology extracurricular at Muhammadiyah Junior High School Tanjung Selor has successfully produced digital learning innovations that meet the criteria of validity, practicality, and effectiveness. The main findings of this study indicate that the integration of website technology in extracurricular learning not only serves to digitize conventional materials but also reconstructs the learning experience to be more interactive, accessible, and meaningful.

The developed learning media has proven capable of transforming the role of educators from information providers to learning facilitators who optimize the potential of technology to create a collaborative and independent learning environment. A significant contribution of this research lies in the development of a hybrid learning model that integrates cognitive, affective, and psychomotor aspects through a digital platform that is responsive to the characteristics of junior high school students. The successful implementation of website-based learning media demonstrates a new paradigm in organizing extracurricular activities that is not limited to conventional learning space and time, allowing students to access materials flexibly while maintaining the quality of educational interactions.

Further research is recommended to develop more comprehensive effectiveness measurement instruments to assess the long-term impact of website-based learning media on students' mastery of digital skills and technological literacy. The implementation of this learning media can be adapted for other subjects by making modifications according to the characteristics of the material and specific learning needs. Educational institutions are recommended to integrate the development of website-based learning media into teacher training programs to improve educators' digital competencies and optimize the use of learning technology. Further development can be directed at the integration of artificial intelligence and learning analytics to create personalized learning that is more adaptive to individual student needs, as well as the implementation of more complex gamification to increase engagement and motivation in the context of sustainable extracurricular learning.

References

Amin, S., Sari, D. I., & Liesdiani, M. (2022). Pengembangan Media Pembelajaran Berbasis Website Menggunakan Pendekatan Problem-Solving pada Materi SPLTV Kelas X. Jurnal Cendekia : Jurnal Pendidikan Matematika, 6(2), 1962–1977. https://doi.org/10.31004/cendekia.v6i2.1432

Darman. (2020). Media Pembelajaran Berbasi Web Dengan Menggunakan Microsoft Expression Web Pada Mata Pelajaran IPA Terpadu Di SMP Negeri 2 Konawe Selatan. In Kendari: Universitas Muhammadiyah Kendari.

Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. Journal of Educational Technology Systems, 49(1), 5–22. https://doi.org/10.1177/0047239520934018

Educhannel. (2020). Fungsi dan Manfaat Pembelajaran Berbasis Website. Retrieved from EduChannel Indonesia. Retrieved from https://educhannel.id/artikel/umum/fungsi-dan-manfaat-pembelajaran-berbasis-web.html

Fikri, H., & Madonna, A. S. (2020). Pengembangan Media Pembelajaran Berbasis Multimedia Interaktif. In Penerbit Samudra Biru (Anggota.

Karyati, A. (2023). Efektivitas Penggunaan Website Pembelajaran Dalam Meningkatkan Motivasi Belajar Siswa. AKSARA: Jurnal Ilmu Pendidikan Nonformal, 9(3), 1665–1674.

Larisu, Z., Irwansyah, R., & Djuhardi, L. (2022). The Role of Film as an Alternative Media in the Learning Process. 4(1).

Mannan, A., Wulandari, S., Romadhoni, A., & Fitriyah, E. (2023). Peran media pembelajaran audio visual dalam meningkatkan minat belajar siswa pada mata pelajaran PAI. Rabbani: Jurnal Pendidikan Agama Islam, 4(1), 1–18. https://doi.org/htts://doi.org/10.19105/rjpai.v4i1.7580

Meduri, N. R. H., Firdaus, R., & Fitriawan, H. (2022). Efektifitas Aplikasi Website Dalam Pembelajaran Untuk Meningkatkan Minat Belajar Peserta Didik. Akademika : Jurnal Teknologi Pendidikan, 11(2), 283–294. https://doi.org/10.34005/akademika.v11i02.2272

Meiliyanthi, I., Firdaus, F., & Purnamawati. (2022). Pentingnya Penerapan Pembelajaran Berbasis Web Pada Wawasan Pendidikan Kejuruan. EDUTECH : Jurnal Inovasi Pendidikan Berbantuan Teknologi, 2(2), 150–157. https://doi.org/10.51878/edutech.v2i2.1207

Novitasari, Y. S., Adrian, Q. J., & Kurnia, W. (2021). Rancang Bangun Sistem Informasi Media Pembelajaran Berbasis Website. Jurnal Teknologi Dan Sistem Informasi (JTSI), 2(3), 136–147. Retrieved from http://jim.teknokrat.ac.id/index.php/JTSI

Nusa. (2020). Reserarch & Development (Penekitian Dan Pengembangan) Suatu Pengantar. In Jakarta: Rajawali Pers.

Rahmawati, D. (2022). Student-Centered Learning in the Digital Age. Advances in Educational Research.

Riadi, M. (2022). Model Pembelajaran ADDIE. Retrieved from Kajian Pustaka. Retrieved from https://www.kajianpustaka.com/2022/08/model-pembelajaran-addie.html

Rijal, A. S., & Jaya, R. (2020). Pengembangan Media Pembelajaran Berbasis Web Untuk Meningkatkan Kreativitas Guru. Jurnal IDEAS Pendidikan, Sosial, Dan Budaya, 6(1), 81–96.

Rusdi, M. (2020). Penelitian Desain dan Pengembangan Kependidikan (Konsep, Prosedur dan Sintesis Pengetahuan Baru). In Depok: PT Raja Grafindo Persada.

Rusman, Kurniawan, D., & Riyana, C. (2020). Pembelajaran Berbasis Teknologi Informasi dan Komunikasi. Jakarta: Raja Grafindo Persada.

Saputra, V. H., & Febriyanto, E. (2020). Media Pembelajaran Berbasis Multimedia Untuk Anak Tuna Grahita. Mathema Jurnal Pendidikan Matematika, 1(1), 15–23.

Shilviana, K., & Hamami, T. (2020). Pengembangan Kegiatan Kokurikuler dan Ekstrakurikuler. Palapa : Jurnal Studi Keislaman Dan Ilmu Pendidikan, 8(1), 159–177. https://doi.org/10.36088/palapa.v8i1.705

Sitinjak, D. D. J. T., Maman, & Suwita, J. (2020). Analisa Dan Perancangan Sistem Informasi Administrasi Kursus Bahasa Inggris Pada Intensive English Course Di Ciledug Tangerang. Insan Pembangunan Sistem Informasi Dan Komputer (IPSIKOM), 8(1). https://doi.org/10.58217/ipsikom.v8i1.164

Suryani, N. (2022). The Role of Multimedia in Web-Based Learning. Journal of Educational Technology.

UNESA. (2020). Media Pembelajaran Berbasis Website Tidak Ada Matinya. Retrieved from Universitas Negeri Surabaya. Retrieved from https://pe.feb.unesa.ac.id/post/media-pembelajaran-berbasis-website-tidak-ada-matinya

Yahya, M., & Amirzan. (2020). Tanggapan Siswa Terhadap Manfaat Kegiatan Ekstrakurikuler Olahraga Dalam Pengembangan Prestasi Dan Potensi Diri. Jurnal Sosial Humaniora (JSH), 2(1), 79–87.

Zahwa, F. A., & Syafi'i, I. (2022). Pemilihan Pengembangan Media Pembelajaran Berbasis Teknologi Informasi. Equilibrium: Jurnal Penelitian Pendidikan Dan Ekonomi, 19(01), 61–78. https://doi.org/10.25134/equi.v19i01.3963