Wordwall Media with a Gameshow-Quiz Type to Increase Students' Interest in IPAS Learning at Elementary School

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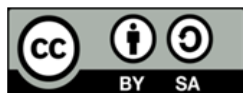
ABSTRAK

Perilaku dan sikap siswa pada saat pembelajaran, yaitu masih terlihat pasif, mudah bosan, kurang terlibat, serta sering mengabaikan penjelasan guru ketika menerima materi pelajaran. Hal ini disebabkan materi yang hanya memanfaatkan media pembelajaran yang monoton, kurang inovatif, dan hanya mengandalkan buku bacaan untuk pembelajaran. Diperlukan media pembelajaran yang terbaru dalam pembelajaran. Penelitian ini bertujuan untuk mengembangkan media Wordwall Tipe Gameshow Quiz pada peningkatan minat belajar IPAS siswa kelas IV di Sekolah Dasar. Peneltian ini menggunakan metode penelitian pengembangan model Dick and Carey. Sampel dalam penelitian ini adalah purposive sampling sehingga sampel dalam penelitian yang digunakan adalah kelas IV, teknik pengumpulan data dalam penelitian ini yaitu melalui angket minat belajar siswa pada mata pelajaran IPAS. Berdasarkan hasil penelitian dapat disimpulkan bahwa pengembangan media pembelajaran untuk peningkatan minat belajar IPAS siswa dengan akhir rata-rata mencapai 90% tingkat ketuntasan siswa. Kelayakan media pembelajaran yang dihasilkan dari materi dan ahli media adalah valid dan layak digunakan sebagai media pembelajaran.

ABSTRACT

Student behavior and attitudes during learning, namely still seen as passive, easily bored, less involved, and often ignore teacher explanations when receiving lesson materials. This is caused by materials that only utilize monotonous learning media, are less innovative, and only rely on reading books for learning. The latest learning media are needed in learning. This study aims to develop Wordwall media with a Gameshow-Quiz type to enhance the learning interest of fourth-grade students in elementary school, specifically focusing on the subject of IPAS. This study employs the Dick and Carey model of research and development methodology. The sample in this research was a purposive sampling from fourth-grade classes. Data collection in this study involves the use of student interest questionnaires focused on the IPAS subject. Based on the research findings, it can be concluded that the development of learning media to enhance students' interest in IPAS achieves an average final score of 90%, indicating a mastery level among students. The feasibility of the learning media, evaluated by content experts and media specialists, confirms its validity and suitability for educational use.

1. INTRODUCTION

Education is a conscious effort intentionally made to develop human potential. Besides economics, politics, and security, it is also a field that plays a crucial role in the development of a country. The progress of a nation is greatly influenced by the advancement or setback of its education; therefore, to achieve optimal results, the best possible education must be provided (Anderson & Boyle, 2019; Defitrika & Mahmudah, 2021). School, as a social system, should provide an atmosphere conducive to education. Education is also the right of every citizen, as stated in Article 4 of the preamble of the Constitution of the Republic of Indonesia of 1945. This right aims to protect all Indonesian people and the blood ties of the Indonesian nation, advance public welfare, educate the nation's life, and participate in maintaining world order based on freedom, eternal peace, and social justice. Furthermore, Article 31, Paragraph 1 of the Constitution of the Republic of Indonesia of 1945 states that 'every citizen has the right to education." This article shows that the government is responsible for closely monitoring the education process in Indonesia to reduce the access gap to education for all citizens (Iqbal et al., 2021; Suyanto, 2017).

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Learning at the elementary school (SD) level still appears to be monotonous. Students nowadays tend to concentrate more on memorizing and recalling lesson materials. If teachers only deliver their teaching materials through lectures, it will make students feel bored, passive, and sleepy during lessons (Asokan et al., 2019; Ranuharja et al., 2021). Previous study asserts that learning processes utilizing media will achieve more effective and productive learning, as well as fostering positive relationships between teachers and students (Erdemir & Brutt-Griffler, 2020; Rahayu et al., 2023). In order for teachers to develop students' potential, an active learning process design is required. Teachers are expected to develop learning activities that can enhance students' capacity because ideally, appropriate learning emphasizes student activity. However, in reality, during learning sessions, students still depend on teachers, resulting in less active participation in learning. On the other hand, previous study states that learning outcomes are greatly influenced by systematically designed learning approaches (Rizk & Hillier, 2022).

Recently, a new curriculum has emerged, called the Kurikulum Merdeka. Kurikulum Merdeka is described as a learning plan that provides opportunities for students to learn and develop their natural talents in a relaxed, comfortable, enjoyable, stress-free, and pressure-free environment (Jufriadi et al., 2022; Marlina, 2022). Kurikulum Merdeka emphasizes independence and innovative thinking. One of the initiatives proposed by the Ministry of Education and Culture of the Republic of Indonesia to introduce independent learning is the launch of the Sekolah Penggerak Program (Iis et al., 2022; Syafi'i, 2021). The aim of this school program is to provide meaningful support to all schools in developing a generation of lifelong learners with the spirit and character of Pancasila students (Nggano et al., 2022; Utari & Afendi, 2022). However, previous study notes that the Kurikulum Merdeka possesses characteristics, such as its fundamental concept being of paramount importance (Budiono & Hatip, 2023). The Kurikulum Merdeka aligns with the objectives of the National Education System and adheres to National Education Standards. This curriculum establishes student profiles, organizes learning outcomes by phase, and annually schedules per-hour lessons. Within educational units, time allocation for learning becomes more flexible. The Kurikulum Merdeka strengthens differentiated learning (a method that allows teachers to create relevant, challenging, and meaningful learning experiences for all students in the class) according to the stages of student achievement (Marlina, 2022; Syaripudin. et al., 2023).

Contemporary education is currently undergoing significant changes. From traditional teaching methods (knowledge transfer) where the teacher is at the center, it is transitioning to a new, innovative learning paradigm (knowledge construction) where the student is the
primary focus in the learning process (Clements & Redding, 2020; Sousa et al., 2022). On average, educators at the elementary school level are not adequately prepared to face the dynamics of such a learning process, including IPAS subjects. This new paradigm highly values individual differences, given the inevitable diverse IPAS abilities within the classroom. Therefore, the aim is to foster a learning society within the learning process and ensure the implementation of the principles of education for all, guaranteeing that education is the right of everyone, not just for students deemed proficient in IPAS and Bahasa Indonesia (Airlanda, 2021; Hardiansyah et al., 2022). This is because IPAS learning plays a crucial role in the intellectual and creative development of students. IPAS is systematically structured to make learning interactive, inspiring, enjoyable, and challenging, thereby encouraging active participation and supporting creativity, independence, and children's psychology (Cordes et al., 2023; Ebersbach & Brandenburger, 2020).

The progress of information and communication technology (ICT) in the current era of globalization is rapidly advancing in the field of education. However, this progress does not have a significant impact on education as a whole. The results of ICT in education, whether directly or indirectly, depend on the implementation and development of ICT (Al Mamun et al., 2022; A. S. Fatimah & Santiana, 2017). This means that teachers must learn, use, and introduce ICT to their students as soon as possible. The faster the advancement of information technology, the more positive impact it will have on education, especially on the implementation of learning media (Arpaci & Basol, 2020; Taufiq et al., 2019). One of the teacher's tasks when designing the learning process is to design and prepare media. Therefore, teachers must have creativity in selecting and determining technology as learning media.

To sustain students' interest and engagement in upcoming learning sessions, educators persist in employing learning media to ensure efficient, effective, engaging, and non-monotonous learning experiences. Wordwall, a form of media based on interactive games, is selected for delivering lesson materials or assessing students' learning (Ismiyati & Saputri, 2020). Wordwall is an educational game designed to engage students in the learning process, categorized as 'learning while playing,' offering various types of interactive quiz games. Wordwall was developed to aid educators in crafting educational game-based learning media online, without the need for programming skills, thus enabling them to customize the provided learning materials (Aeni et al., 2022; Arsini et al., 2022).

The results of observations conducted by researchers at 2 (two) public elementary schools found issues among fourth-grade students regarding their lack of interest in IPAS subjects. This can be observed from the behavior and attitudes of the students during learning sessions, where they still appear passive, easily bored, and less engaged, and often disregarding teacher explanations when receiving lesson materials (Aluintany & Bektiningsih, 2024; Romero et al., 2020). This is caused by the influence of the use of learning media by teachers seen from the learning process or the delivery of materials that only utilize monotonous, less innovative learning media and rely solely on reading books for learning. The solution to make learning varied and able to increase student interest in learning activities is to use various media, one of which is Wordwall. According to previous study who applied online games to enhance learning interest, it is evident that the online game learning platform Wordwall can influence the learning interest of fourth-grade students at SDN 1 Sukorame (Nisa & Susanto, 2022).

Based on the aforementioned issues, the researcher finds it imperative to develop learning media utilizing the chosen medium, specifically the game show quiz type employed by educators, such as quiz games, to instill a renewed interest in learning among students. Wordwall can serve as both a medium and an evaluation tool in the learning process. The novelty of this research is developing Wordwall media in a show-quiz game format, which is specifically designed for science (natural and social sciences) learning in elementary schools. This innovation is rarely carried out in the context of science and science learning, because Wordwall is usually used for other subjects or as a simple aid, not as an instrument to increase interest in learning specifically through a show-quiz type game.

2. METHOD

This research is a development study using the Dick and Carey model. The steps of the learning process encompass (1) identifying general learning objectives, (2) conducting instructional analysis, (3) Identifying input behaviors and student characteristics" for clarity and coherence, (4) formulating objectives for performance, (5) creating benchmark test questions, (6) developing teaching strategies, (7) developing and selecting teaching materials, (8) implementing formative evaluation, (9) revising learning materials, (10) designing and conducting summative evaluation (Dick & Carey, 2019). Figure 1 illustrates these steps visually.
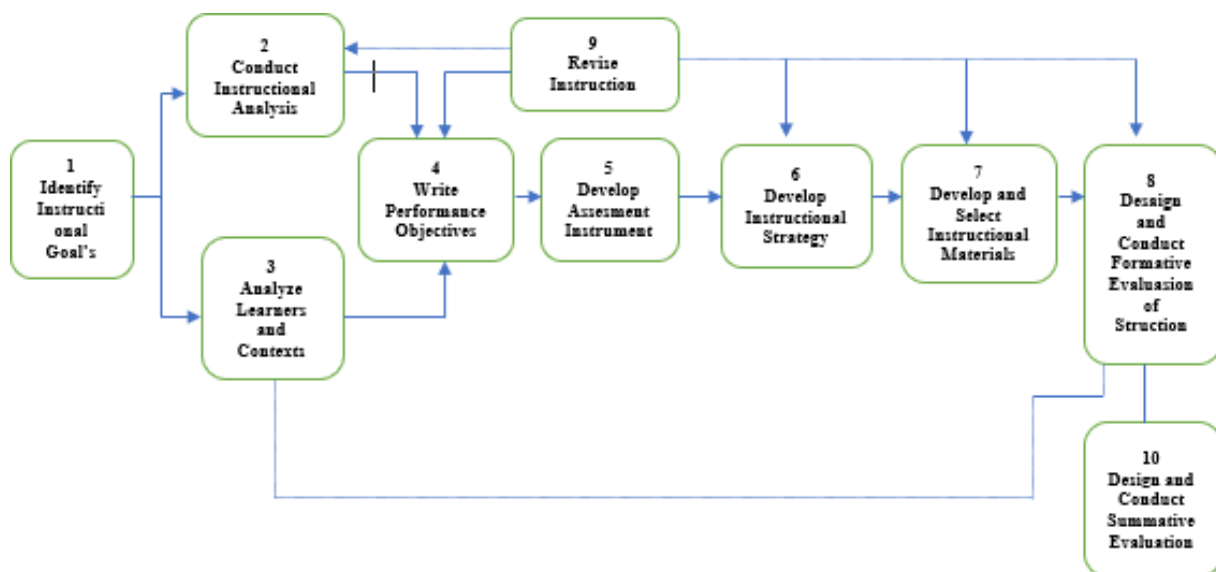

Figure 1. Dick and Carey Learning Model Flow Chart

From Figure 1, there are 10 steps above, to facilitate researchers in conducting research and development, the researcher adopts the assumption proposed by (Fatmawati, 2021) that the development stages can be grouped into 6 (six) stages, namely, 1) research observation; 2) Making Learning Materials with Wordwall Learning Media Type Gameshow Quiz using the Web Wordwall.net 3) Collecting data on the needs of learning media; 4) Developing web-based learning media; 5) Review and testing of both the first and second products; and 6) Product effectiveness testing. This research was conducted at SDN Kosambibatu II. The subjects in this study were fourth-grade students totaling 34 students (grouped, with each group consisting of 5-6 students). The data collection instrument used in this study was a questionnaire on the interest in IPAS subjects among fourth-grade elementary school students.

3. RESULT AND DISCUSSION

Result
Validation by Design and Learning Material Experts

Validation results by design and learning material experts received a rating of 76%, and after revision, reached 90% after adjustment with the criteria table of feasibility, thus this score falls under the "very valid" criteria. Suggestions from material experts generally indicate that the material is already in line with the Learning Objectives, and the concepts embodied in the learning media are excellent. The assessment results by learning design experts, which cover aspects of attractiveness of the physical appearance, accuracy of design usage, format suitability, presentation with target characteristics, clarity of media instructions, clarity of material exposure, and alignment of evaluation with the material as a whole, can be concluded that the achievement level score is 82% at stage I and 94% at stage II, where the range is in the achievement level score of 85 - 100 categorized as "Very Good". The assessment results on learning design in the development of learning media.

Validation of the Wordwall media with a Gameshow-Quiz

The activity conducted focused on developing Wordwall media with a Gameshow-Quiz format. To create the materials or questions on Wordwall, hardware such as laptops or smartphones was used, while the software component was accessed through the web-based platform, wordwall.net. The steps to use this Wordwall learning media are as follows: first, open a browser and navigate to https://wordwall.net/. Next, click on "Sign Up" and either choose a Google or Facebook account for registration or fill in the required information manually. After signing in, select "Create Activity" to access available templates, then choose the preferred template. Once selected, input the questions or content for the quiz. When editing is complete, click "Done" to finalize, and then use the "Share" option if you want to distribute the created content. Initial question starting gameshow is show in Figure 2.

Figure 2. Initial Question Starting Gameshow

The assessment results of learning media using Wordwall in teaching IPAS in fourth-grade elementary school are excellent and considered suitable for use. This can be seen from the results of the validity test of the learning media obtained from validators of content, media, and language. The content aspect validity test scored 90%, falling under the 'very valid' category. The media aspect validity test scored 88.75%, also falling under the 'very valid' category. And the validity test of the language aspect yielded a score of 82.5%, falling within the valid category.

The learning media used in the trial schools received excellent ratings, as seen from the assessment results of teacher and student response questionnaires. The implementation of learning using Wordwall learning media in the research schools received very positive responses, as evidenced by the enthusiasm of the students. The results of the assessment by media design expert 1 on the design of learning media in the development of the Wordwall gameshow quiz type media to enhance students' interest in IPAS at elementary schools. Next, the design phase. At this stage, designing and conceptualizing interactive media ideas in the form of Wordwall. This design process is crucial to ensure that learning media can be developed easily and systematically. Subsequently, the design process entails creating learning media content using Wordwall. The development stage consists of validating the media with expert validators and revising the media until it is suitable for use in the learning process. The evaluation stage is conducted to determine the evaluation results qualitatively and quantitatively.

First Trial Results

The first trial was conducted in the fourth grade at SDN Kosambibatu II, consisting of 34 students. The objective of this pretest trial is the development of Wordwall media in improving students' interest in learning IPAS subjects. The responseand assessment of the Wordwall Gameshow Quiz media overall scored 82%. Accordingto the criteria for assessing interactive learning, it falls under the category of "Very Good." During the implementation of the first trial conducted with 34 fourth-grade students at SDN Kosambibatu, there were comments and suggestions regarding the Wordwall media product containing IPAS learning materials that need to be revised. The data from the pre-test and post-test results are presented below to assess the practicality of developing Wordwall Gameshow Quiz media, yielding an average pre- test score of 50.15% and 66.76%. Statistical data on the pretest and posttest results of student learning interest. Pretest and posttest results of students' learning interest is show in Figure 3.
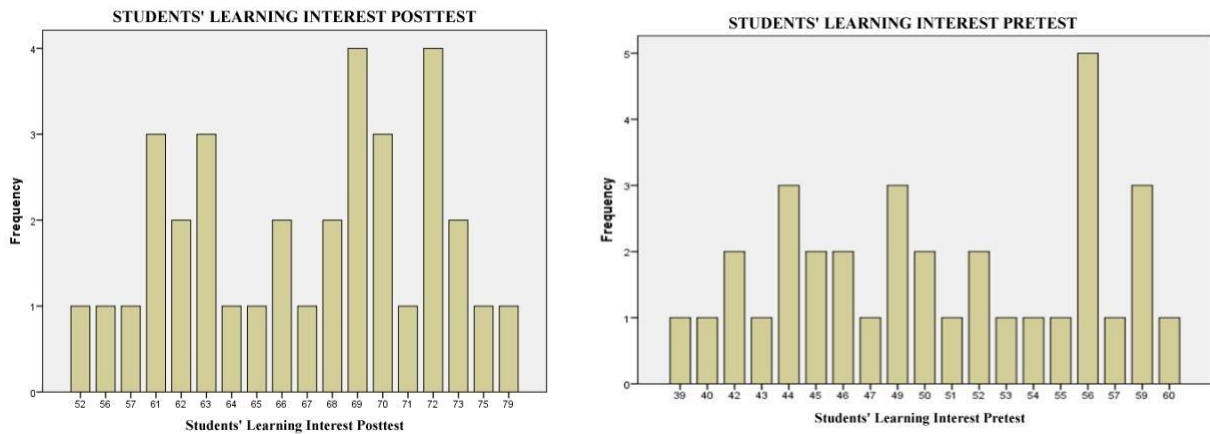

Figure 3. Pretest and Posttest Results of Students' Learning Interest

From Figure 3, it can be concluded that the Wordwall media with a Gameshow- Quiz type in enhancing students' interest in learning IPAS is developed in accordance with the current needs of the students and meets the researcher's expectations.

Second Trial Results

The asses the effectiveness of developing Wordwall media with a Gameshow-Quiz type in improving students' interestin learning IPAS using the website wordwall.net, refer to Figure 4.

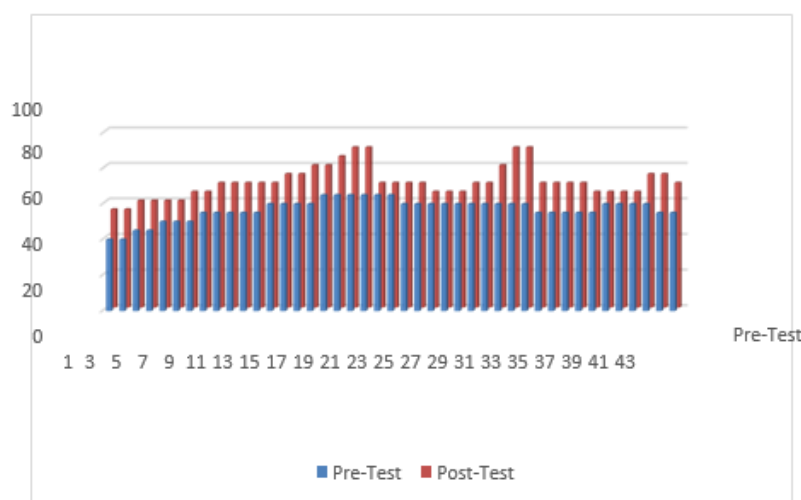**Figure 4.** Second Trial Results Graph

Based on Figure 4, the data on completeness in the above trial, 50.15% of students showeda high level of interest in learning. Furthermore, in Trial 2, an 80% rate was obtained, which falls under the criteria

of qualitative goodness. Next, calculations were made using the Paired Two Sample t-Test for Means to observethe differences in the results of the second trial. Based on the results, it can be concluded that the Paired Sample t-test indicates a significance value of 0.000, this signifies that the value is less than 0.05, implying the rejection of Ho and acceptance of HI, consequently, the wordwall media of thegameshow quiz type, containing IPAS material, is deemed effective

Discussion

The validity of the wordwall media in learning has been tested by subject matter experts, instructional design experts, and media experts. Each expert provided assessments on each indicator found in the validation sheet. Media validation took the form of a quantitative descriptive assessment questionnaire expressed in score distributions and rating scale categories (Agusti & Aslam, 2022; Savira & Gunawan, 2022). Based on the validation results, subject matter experts obtained a score of 90%, categorized as highly valid. Media validation yielded a score of 88.75%, also categorized as highly valid, while language validation resulted in a score of 82.5%, categorized as valid. Overall, subject matter experts suggested that the content aligns well with the Learning Outcomes, and the concepts conveyed in the instructional media are excellent (Aeni et al., 2022; Rosmana et al., 2023). In the first trial, the media feasibility test obtained a percentage of 50.15% among 34 students, and in the second trial, with an 80% participation rate among 43 individuals, it was categorized as very good and suitable. The media is declared practical and effective for use.

Based on the research results, it is shown that the development of instructional media using wordwall has a very positive impact on the IPAS learning process in Class IV of SDN Kosambibatu II. The use of wordwall instructional media can help meet the needs of students because the materials summarized in the instructional media are cited from various relevant sources aligned with the initial competencies, learning outcomes, and the flow of learning objectives found in the independent curriculum (Hidayaty et al., 2022; Ma'rifah & Mawardi, 2022). Additionally, the use of wordwall instructional media increases students' enthusiasm and motivation to complete learning assessments due to its attractive and engaging appearance, providing a new experience for students to avoid feeling bored or tired during the completion of learning materials and assessments at school (Hidayaty et al., 2022; Jannah & Syafryadin, 2022).

In line with previous study the use of wordwall instructional media in the learning process can help meet the needs of students (Jannah & Syafryadin, 2022). This is because the materials summarized in the instructional media are cited from various relevant sources aligned with the initial competencies, learning outcomes, and the flow of learning objectives found in the independent curriculum. Additionally, the use of wordwall instructional media increases students' enthusiasm and motivation to complete learning assessments due to its attractive and engaging appearance, providing a new experience for students to avoid feeling bored or tired during the completion of teaching materials and learning assessments at school (Savira & Gunawan, 2022; Yuniar et al., 2021).

Learning media is intended as a tool to support teachers in delivering materials and making assessments during the learning process. According to previous study learning media is a tool or object that supports students in understanding lesson materials and encourages students to learn (Izhar et al., 2022). By using Wordwall as a creative and innovative interactive learning media, teachers can utilize it to create a more effective and enjoyable learning environment, promoting the growth and development of students in the cognitive domain. In the context of learning, students' readiness to learn greatly depends on their individual interests (Lampropoulos et al., 2019; Reyna et al., 2017). Interest in learning is defined as the attention or engagement in activities stemming from one's inner drive, gradually leading to benefits, enjoyment, and satisfaction.

During the learning process, interest serves as a "Motivating Process," representing the energy that boosts students' engagement in learning. When a student shows interest in a particular learning topic, it indicates their engagement and increased attention to that subject (Aristawati & Budiyanto, 2017; Hanif et al., 2019). Observations from the IPAS learning process indicate that students' interest appears passive; thus, it is essential to implement steps that can engage and captivate students' interest, ensuring it is easily accepted, comprehensible, and engaging (S. Fatimah & Fatonah, 2023; Silva et al., 2017).

The development of Wordwall media in the form of a gameshow-quiz provides visual and interactive stimulation that can increase students' interest in learning IPAS (Natural and Social Sciences). This can be one way to make learning more fun, helping students be more active and involved in the learning process. However, although this media is effective in increasing interest in learning, this study may not have evaluated whether the gameshow-quiz media can help students achieve a deep understanding of the material. Therefore, there is a risk that students may focus more on the game aspect than on the learning itself

4. CONCLUSION

Based on the researcher's conducted research, it can be concluded that the development of wordwall instructional media in the form of a gameshow quiz is highly effective and suitable for enhancing the learning interest of elementary school students. The final results of the validation test for the development of instructional media using wordwall indicate validity and suitability for field trials. Furthermore, the practicality test results of the instructional media using wordwall, developed by the researcher, have been dee`med practical by both teachers and fourth-grade students in both the trial school and the research school. This is supported by the pre-test and post-test results, which initially averaged 50.15% and increased to 66.67% after using the media. Based on the research findings, it is concluded that the development of wordwall instructional media in the form of a gameshow quiz is highly suitable for use as instructional media, and it has been found to enhance students' learning interest, with the final average reaching a 90% student mastery level. The instructional media's validity and suitability, as assessed by subject matter experts and media experts, are confirmed, making it appropriate for instructional use.

5. REFERENCES

Aeni, A. N., Djuanda, D., Maulana, M., Nursaadah, R., & Sopian, S. B. P. (2022). Pengembangan Aplikasi Games Edukatif Wordwall Sebagai Media Pembelajaran Untuk Memahami Mater Pendidikan Agama Islam Bagi Siswa Sd. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, *11*(6), 1835. https://doi.org/10.33578/jpfkip.v11i6.9313.

Agusti, N. M., & Aslam, A. (2022). Efektivitas media pembelajaran aplikasi wordwall terhadap hasil belajar ipa siswa sekolah dasar. *Jurnal Basicedu*, *6*(4), 5794–5800. https://doi.org/10.31004/basicedu.v6i4.3053.

Airlanda, P. (2021). Pengembangan Media Animus dalam Pembelajaran IPAS di Sekolah Dasar. *Jurnal Basicedu*, *5*(3), 1683–1688. https://doi.org/https://doi.org/10.31004/basicedu.v6i6.4999.

Al Mamun, M. A., Lawrie, G., & Wright, T. (2022). Exploration of learner-content interactions and learning approaches: The role of guided inquiry in the self-directed online environments. *Computers & Education*, *178*, 104398. https://doi.org/10.1016/j.compedu.2021.104398.

Aluintany, V. G., & Bektiningsih, K. (2024). Interactive Game Learning Media Based on Canva on Five Sensory Materials for Grade IV Elementary School. *Jurnal Ilmiah Sekolah Dasar*, *8*(1), 186–192. http://www.jurnalfkip.unram.ac.id/index.php/JPM/article/view/6668.

Anderson, J., & Boyle, C. (2019). Looking in the mirror: reflecting on 25 years of inclusive education in Australia. *International Journal of Inclusive Education*, *23*(7–8), 796–810. https://doi.org/10.1080/13603116.2019.1622802.

Aristawati, F. A., & Budiyanto, C. (2017). Penerapan Robotika Dalam Pembelajaran STEM:Kajian Pustaka. *Prosiding Seminar Nasional UNS Vocational Day*, *2*, 440–446. https://doi.org/10.20961/uvd.v1i0.15854.

Arpaci, I., & Basol, G. (2020). The impact of preservice teachers' cognitive and technological perceptions on their continuous intention to use flipped classroom. *Education and Information Technologies*, 3503–3514. https://doi.org/10.1007/s10639-020-10104-8.

Arsini, N. N., Santosa, M. H., & Marsakawati, N. P. E. (2022). Hospitality School Students' Perception on the Use of Wordwall to Enrich Students' Work-Ready Vocabulary Mastery. *Elsya : Journal of English Language Studies*, *4*(2), 124–130. https://doi.org/10.31849/elsya.v4i2.8732.

Asokan, A. G., Varghese, V. A., & Rajeev, A. (2019). Internet addiction among medical students and its impact on academic performance: an Indian study. *Journal of Medicine of Science Clinical Research*, *7*, 670–676. https://doi.org/10.18535/jmscr/v7i3.122.

Budiono, A. N., & Hatip, M. (2023). Learning Assesment in the Independent Curriculum. *Jurnal Axioma: Jurnal Matematika Dan Pembelajaran*, *8*(1). https://www.academia.edu/download/108544205/1399.pdf.

Clements, L., & Redding, E. (2020). Creativity in Higher Education Contemporary Dance. *Journal of Dance Education*, *20*(2), 88–98. https://doi.org/10.1080/15290824.2019.1572155.

Cordes, A.-K., Egert, F., & Hartig, F. (2023). Fostering Child Language with Short-Term Digital Storybook Interventions. *Zeitschrift Für Entwicklungspsychologie Und Pädagogische Psychologie*, *0*. https://doi.org/10.1026/0049-8637/a000264.

Defitrika, F., & Mahmudah, F. N. (2021). Development of Life Skills Education As Character Building. *International Journal of Educational Management and Innovation*, *2*(1), 116. https://doi.org/10.12928/ijemi.v2i1.3195.

Dick, W., & Carey, L. (2019). *The Dick and Carey Model*. http://www.nwlink.com/~donclark/history_isd/carey.html.

Ebersbach, M., & Brandenburger, I. (2020). Reading a short story changes children's sustainable behavior in a resource dilemma. *Journal of Experimental Child Psychology*, *191*, 104743. https://doi.org/10.1016/j.jecp.2019.104743.

Erdemir, E., & Brutt-Griffler, J. (2020). Vocabulary Development Through Peer Interactions in Early Childhood: A Case Study of an Emergent Bilingual Child in Preschool. *International Journal of Bilingual Education and Bilingualism*, *25*(3), 834–865. https://doi.org/10.1080/13670050.2020.1722058.

Fatimah, A. S., & Santiana, S. (2017). Teaching in 21St Century: Students-Teachers' Perceptions of Technology Use in the Classroom. *Script Journal: Journal of Linguistic and English Teaching*, *2*(2), 125. https://doi.org/10.24903/sj.v2i2.132.

Fatimah, S., & Fatonah, S. (2023). Development of Focusky Multimedia-Based Comics to Increase Students' Learning Interest in Science Subjects. *Jurnal Penelitian Pendidikan IPA*, *9*(4), 2082–2088. https://doi.org/10.29303/jppipa.v9i4.3444.

Hanif, S., Wijaya, A. F. C., & Winarno, N. (2019). Enhancing Students' Creativity through STEM Project-Based Learning. *Journal of Science Learning*, *2*(2), 1–14. https://doi.org/10.17509/jsl.v2i2.13271.

Hardiansyah, F., Muhammad Misbahudholam, A. R., & Hidayatillah, Y. (2022). IPAS Learning Assessment To Measure Science Process Skill In Elementary School. *International Journal of Elementary Education*, *6*(4), 612–623. https://doi.org/https://doi.org/10.23887/ijee.v6i4.54217.

Hidayaty, A., Qurbaniah, M., & Setiadi, A. E. (2022). *Pengaruh Media Wordwall Terhadap Minat Dan Hasil Belajar The Influence of Wordwall on Students Interests and Learning Outcomes*. *15*(10), 1–10. https://doi.org/10.21831/jpipfip.v15i2.51691.

Iis, N., Arita, M., Maratun, N., & Nugraheni, R. (2022). Nilai Kearifan Lokal: Projek Paradigma Baru Program Sekolah Penggerak untuk Mewujudkan Profil Pelajar Pancasila. *Jurnal Basicedu*, *6*(3), 3639–3648. https://doi.org/10.31004/basicedu.v6i3.2727.

Iqbal, M. H., Siddiqie, S. A., & Mazid, M. A. (2021). Rethinking theories of lesson plan for effective teaching and learning. *Social Sciences & Humanities Open*, *4*(1), 100172. https://doi.org/10.1016/j.ssaho.2021.100172.

Ismiyati, W. L., & Saputri, T. (2020). Using Wordwall to Improve English Vocabulary Mastery: Systematic Review. *Jurnal Pendidikan Dan Pembelajaran*, *12*(2), 120–131. http://repository.unusa.ac.id/id/eprint/6581.

Izhar, G., Wardani, K., & Nugraha, N. K. (2022). The Development Enviromental Literacy Media Learning for Elementary School Student. *Journal of Innovation in Educational and Cultural Research*, *3*(3), 397–404. https://doi.org/10.46843/jiecr.v3i3.116.

Jannah, M., & Syafryadin, S. (2022). EFL Students' Perspectives on the Use of Wordwall.net as Vocabulary Learning Media. *ELT Forum: Journal of English Language Teaching*, *11*(2), 115–124. https://doi.org/10.15294/elt.v11i2.57120.

Jufriadi, A., Huda, C., Aji, S. D., Pratiwi, H. Y., & Ayu, H. D. (2022). Analisis Keterampilan Abad 21 Melalui Implementasi Kurikulum Merdeka Belajar Kampus Merdeka. *Jurnal Pendidikan Dan Kebudayaan*, *7*(1), 39–53. https://doi.org/10.24832/jpnk.v7i1.2482.

Lampropoulos, G., Siakas, K., & Anastasiadis, T. (2019). Internet of Things in the Context of Industry 4.0: An Overview. *International Journal of Entrepreneurial Knowledge*, *7*(1), 4–19. https://doi.org/10.2478/ijek-2019-0001.

Ma'rifah, M. Z., & Mawardi, M. (2022). Peningkatan Kemampuan Berpikir Kritis Siswa Menggunakan Hyflex Learning Berbantuan Wordwall. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *12*(3), 225–235. https://doi.org/10.24246/j.js.2022.v12.i3.p225-235.

Marlina, T. (2022). Urgensi Dan Implikasi Pelaksanaan Kurikulum Merdeka Pada Sekolah Dasar/Madrasah Ibtidaiyah. *Prosiding Seminar Nasional Pendidikan Ekonomi*, 67–72. https://prosiding.ummetro.ac.id/index.php/snpe/article/view/24.

Nggano, H. E., Arifin, I., & Juharyanto. (2022). Pembentukan Profil Pelajar Pancasila Ditinjau Dari Konsep Society 5.0. *Seminar Nasional Manajemen Strategik Pengembangan Profil Pelajar Pancasila Pada Pendidikan Anak Usia Dini*, *1*(1), 1–10. http://conference.um.ac.id/index.php/ap/article/view/3332.

Nisa, M. A., & Susanto, R. (2022). Pengaruh Penggunaan Game Edukasi Berbasis Wordwall Dalam Pembelajaran Matematika Terhadap Motivasi Belajar. *JPGI (Jurnal Penelitian Guru Indonesia)*, *7*(1), 140. https://doi.org/10.29210/022035jpgi0005.

Rahayu, Y. S., Mujiyanto, J., Suwandi, S., & Fitriati, S. W. (2023). The Impact of Electronic Storybook and Print Picture Book on the Reading Comprehension of Undergraduates with Varying Levels of Critical Thinking. *Migration Letters*, *20*, 224–237. https://jurnal.stkipahsingaraja.ac.id/index.php/tatefl/article/view/665.

Ranuharja, F., Ganefri, G., Fajri, B. R., Prasetya, F., & Samala, A. D. (2021). Development of Interactive Learning Media Edugame Using Addie Model. *Jurnal Teknologi Informasi Dan Pendidikan*, *14*(1), 54–60. https://doi.org/10.24036/tip.v14i1.412.

Reyna, J., Hanham, J., & Meier, P. (2017). A taxonomy of digital media types for Learner-Generated Digital Media assignments. *E-Learning and Digital Media*, *14*(6), 309–322. https://doi.org/10.1177/2042753017752973.

Rizk, J., & Hillier, C. (2022). Digital technology and increasing engagement among students with disabilities: Interaction rituals and digital capital. *Computers and Education Open*, *3*(July), 100099.1-12. https://doi.org/10.1016/j.caeo.2022.100099.

Romero, R., De Las Heras, M. a., Sáenz-Lopez, P., & Fernández-Ozcorta, E. J. (2020). One step closer to understanding motivation in scientific education: The incorporation of science textbooks as a predictor, together with motivational climate and basic psychological needs. *Jurnal Pendidikan IPA Indonesia*, *9*(4), 590–599. https://doi.org/10.15294/jpii.v9i4.24864.

Rosmana, P. S., Iskandar, S., Sari, A. N., Kholida, A., Firdaus, D. N., & Trisnawati, P. (2023). Penggunaan Media Wordwall sebagai Evaluasi Pembelajaran Organ Pernapasan pada Hewan Kelas V di SDN 3 Nagri Kaler. *Journal on Education*, *5*(2), 1965–1973. https://doi.org/10.31004/joe.v5i2.838.

Savira, A., & Gunawan, R. (2022). Pengaruh Media Aplikasi Wordwall dalam Meningkatkan Hasil Belajar Mata Pelajaran IPA di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, *4*(4), 5453–5460. https://doi.org/10.31004/edukatif.v4i4.3332.

Silva, A. B. da, Santos, G. T. dos, & Bispo, A. C. K. de A. (2017). The Comics As Teaching Strategy In Learning Of Students In An Undergraduate Management Program. *RAM. Revista de Administração Mackenzie*, *18*(1), 40–65. https://doi.org/10.1590/1678-69712017/administracao.v18n1p40-65.

Sousa, M. J., Marôco, A. L., Gonçalves, S. P., & Machado, A. de B. (2022). Digital Learning Is an Educational Format towards Sustainable Education. *Sustainability (Switzerland)*, *14*(3), 1–16. https://doi.org/10.3390/su14031140.

Suyanto, S. (2017). A reflection on the implementation of a new curriculum in Indonesia: A crucial problem on school readiness. *AIP Conference Proceedings*, *1868*(1), 39–57. https://doi.org/10.1063/1.4995218.

Syafi'i, F. F. (2021). Merdeka belajar: sekolah penggerak. *Prosiding Seminar Nasional Pendidikan Dasar*, *November*, 46–47. http://ejurnal.pps.ung.ac.id/index.php/PSNPD/article/view/1049.

Syaripudin., Witarsa, R., & Masrul. (2023). Analisis Implementasi Kurikulum Merdeka pada Guru-guru Sekolah Dasar Negeri 6 Selatpanjang Selatan. *Journal of Education Research*, *4*(1). https://doi.org/10.37985/jer.v4i1.142.

Taufiq, M., Ghani, A., Hamzah, M., Ramli, S., Ab, W., Daud, A. W., Rijal, T., Romli, M., Najihah, N., & Mokhtar, M. (2019). a Questionnaire-Based Approach on Technology Acceptance Model for Mobile Digital Game-Based Learning. *Journal of Global Business and Social Entrepreneurship (GBSE)*, *5*(14), 24621714. http://www.gbse.my/V5 NO.14 (MARCH 2019)/Paper-199-.pdf.

Utari, D., & Afendi, A. R. (2022). Implementation of Pancasila Student Profile in Elementary School Education with Project-Based Learning Approach. *EduLine: Journal of Education and Learning Innovation*, *2*(4), 456–464. https://doi.org/10.35877/454ri.eduline1280.

Yuniar, A. I. S., Putra, G. A. P., Purwati, N. E., Hayatunnufus, U., & Nufi'ah, U. (2021). HITARI (Historical-archaeology Heritage Riddle): Pemanfaatan wordwall sebagai media ajar Indonesia zaman prasejarah di Sekolah Menengah Atas. *Jurnal Integrasi Dan Harmoni Inovatif Ilmu-Ilmu Sosial*, *1*(11), 1182–1190. https://doi.org/10.17977/um063v1i112021p1182-1190.