GoAk Bali: An Educational Game for Mastering Balinese Script Based on Self-Regulated Learning for Fourth-Grade Elementary School Students

Ni Nyoman Ayusadewi[1*], I Kadek Suartama[2] (iD)

[1,2] Teknologi Pendidikan, Universitas Pendidikan Ganesha, Singaraja, Indonesia

ARTICLE INFO

ABSTRAK

Minat belajar yang rendah di kalangan siswa menyebabkan hasil belajar yang rendah, yang sebagian besar disebabkan oleh kurangnya media pembelajaran yang sesuai dengan karakteristik siswa. Penelitian ini bertujuan untuk mengembangkan media game edukasi berbasis self-regulated learning untuk meningkatkan hasil belajar bahasa Bali pada siswa kelas 4 Sekolah Dasar. Proses pengembangan mengikuti model ADDIE dan berfokus pada materi aksara Bali. Tiga ahli terlibat dalam penelitian ini: satu ahli isi muatan pelajaran, satu ahli desain pembelajaran, dan satu ahli media pembelajaran. Produk diuji coba pada 3 siswa untuk uji perorangan, 9 siswa untuk uji kelompok kecil, dan 20 siswa untuk uji skala lapangan. Pengumpulan data dilakukan melalui wawancara, observasi, kuesioner, dan tes, serta dianalisis dengan metode kualitatif dan kuantitatif. Hasil penelitian menunjukkan bahwa evaluasi para ahli memberikan penilaian yang sangat baik, dengan evaluasi ahli isi muatan pelajaran sebesar 92,85%, ahli desain pembelajaran 98,75%, dan ahli media pembelajaran 97,64%. Hasil uji coba produk juga menunjukkan kualitas yang sangat baik, dengan uji perorangan mencapai 90,33%, uji kelompok kecil 90%, dan uji skala lapangan 91,5%. Uji efektivitas menunjukkan peningkatan signifikan dalam hasil belajar, dengan skor rata-rata pretest 47,5 dan posttest 80,75. Penelitian ini menyoroti potensi media game edukasi, yang menggabungkan elemen gamifikasi, untuk meningkatkan hasil belajar siswa, memperdalam pengalaman belajar, dan menjadikan pembelajaran lebih menyenangkan.

ABSTRACT

The low interest in learning among students has resulted in poor learning outcomes, which is partly due to the lack of learning media that align with students' characteristics. This study aims to develop an educational game media based on self-regulated learning to improve the learning outcomes of Balinese language for fourth-grade elementary students. The development process follows the ADDIE model and focuses on Balinese script content. Three experts were involved in the study: one content expert, one learning design expert, and one media expert. The product was tested with 3 students in individual trials, 9 students in small groups, and 20 students in field trials. Data were collected through interviews, observations, questionnaires, and tests, and analyzed using both qualitative and quantitative methods. The results show that the expert evaluations rated the product very positively, with content expert evaluation at 92.85%, learning design expert at 98.75%, and media expert at 97.64%. The product trial results also demonstrated excellent quality, with individual testing at 90.33%, small group testing at 90%, and field testing at 91.5%. Effectiveness testing revealed a significant improvement in learning outcomes, with pretest scores averaging 47.5 and post test scores averaging 80.75. This study highlights the potential of educational game media, incorporating gamification elements, to enhance student learning outcomes, deepen the learning experience, and make learning more enjoyable.

1. INTRODUCTION

The development of science develops over time. Likewise, new technologies are created as a result of the development of science which is a sign of the progress of the times. The rapid development of technology makes the role of technology in all areas of life, one of which is in the field of education (Boateng

et al., 2024; Nurillahwaty, 2022). The role of technology in education is a major change and innovation in the learning process. Digital technology is a powerful instrument to help improve education in many ways, such as making it easier for teachers to produce learning materials and providing new methods for learning and collaboration (Haleem et al., 2022; Sembey et al., 2024). Utilizing technology in the world of education can have a positive impact on the learning process (Ambarwati et al., 2022; Miasari et al., 2022). Thus, technological innovation in education is something that can bring good influence and impact to learners and also learners. Technology has a myriad of advantages that make access to information faster and without limits, with this students will find it easier to find learning materials. In addition, teachers must also be able to adjust the learning process with all changes caused by rapid technological developments in order to guide their students. In applying technology in the learning process, teachers must also pay attention to the characteristics of students. The use of innovation in educational game learning media is one of the choices of technology in learning that can help teachers in teaching students (Candra & Rahayu, 2021; Lopez et al., 2021). Educational games are games designed to improve and support the digital learning process (Hang et al., 2023; Oktariyanti et al., 2021).

In reality, learners still have problems in applying the benefits of technology in the learning process. This is supported by the facts described in previous research which states that teachers must be able to facilitate students with digital innovation in the learning process in order to create a smart learning environment (Dewi et al., 2023; Nguyen et al., 2022). Based on the results of observations and interviews conducted at SD Mutiara Singaraja, it was found that teachers have not been able to facilitate students with learning media that utilize digital technology to increase the effectiveness of the learning process. In the learning process, teachers are prone to using lecture methods that tend to have an impact on students' boredom and loss of motivation and low interest in learning. To design a good learning environment, students must be interested, motivated, and involved in an active learning environment (Iskandar et al., 2024; Jääskä et al., 2022). From the results of interviews conducted with grade IV teachers, it was stated that students' daily values in local Balinese language content were still low. In addition, teachers' abilities in creating digital learning media that are fun and can be used by students to support their independent learning process are still limited. This is in contrast to the reality where teachers should have responsibility for everything that happens in class and be able to provide a fun but meaningful learning atmosphere that is poured into digital learning media that is in accordance with student characteristics in order to support students' ability to learn independently and encourage student learning effectiveness (Garini et al., 2020; Jørgensen & Skovbjerg, 2024).

The learning process of elementary school children should be designed with a pleasant, meaningful and efficient atmosphere. Among children, games are considered as one of the fun and motivating activities (Sukatin et al., 2019; Sun et al., 2023). Games in this context are games that have educational purposes and contain content related to learning which is considered more fun, interesting and effective (Suhendar & Yanto, 2023; Sun et al., 2023). Thus, it means that educational games can have a positive impact on children because they can improve cognitive skills, and the rewards or positive feedback obtained can motivate students. The development of educational games based on self-regulated learning is relevant to the problems experienced. Educational games based on self-regulated learning are digital learning media that contain materials, exercises and quizzes that are designed by implementing self-regulated learning components. The educational games developed contain materials about Balinese script supported by exercises and levels, in addition to being equipped with audio, image and video components, instructions and goals or objectives which are expected to increase students' motivation and interest in learning both at school and at home. Instructions and objectives and other gamification elements in educational games can influence cognitive and motivational outcomes (Hu et al., 2024; López-Fernández et al., 2023).

Other previous research that is in line with this, states that educational games are able to increase the effectiveness of student learning (Oktavia, 2022; Vita-Barrull et al., 2024). This also agrees with the results of other studies which say that educational games can increase students' motivation and learning achievement (Byusa et al., 2022; Ratinho & Martins, 2023). From this it can be concluded that the development of educational games can be the right solution to deal with student learning problems. The difference between this study and previous studies is that this study develops educational games using a self-regulated learning basis that will make student learning fun but meaningful and can facilitate increased effectiveness of the student learning process.

The purpose of this study is to develop a Balinese script educational game based on self-regulated learning for grade IV elementary school students. This study also aims to determine the validity of the Balinese script educational game media and the effectiveness of the Balinese script educational game when applied in class. The development of this educational game also aims to improve student learning outcomes in the Balinese script material for grade IV elementary school. The development of a Balinese script educational game based on self-regulated learning is expected to be able to help teachers in facilitating the

student learning process. The novelty of this study lies in the integration of independent learning principles, such as setting learning goals, monitoring progress, and self-reflection, into an interactive and fun game mechanism. This study is also a pioneer in the development of local culture-based educational games for elementary school students with an approach that emphasizes independent learning, which was previously rarely applied to traditional learning topics such as Balinese script. Thus, GoAk Bali not only contributes to cultural preservation, but also opens new paths in innovative technology-based learning design.

2. METHOD

This type of research is a type of development research, with the development model applied being the ADDIE development model (analyse, design, development, implementation, and evaluation). The ADDIE development model was developed systematically and based on the theoretical basis of learning design (Tegeh & Kirna, 2010). This educational game learning media was validated by conducting tests on experts and media users. There were three experts in this study, namely one content expert test, one learning media expert test, and one learning design expert and three product tests including three people for small group tests, 9 people for individual tests and 20 people for field scale tests. The methods used in collecting data in this study were observation, interview, questionnaire and test methods. Observation and interview methods were used to conduct analysis on students. While the questionnaire method was used to determine the validity and effectiveness of the application and to measure the feasibility of educational game media. The test method was used to determine the average learning outcomes of students after using educational game media. The instrument used in data collection was a questionnaire. The instrument compilation grid is presented in Table 1, Table 2, Table 3, Table 4, and Table 5.

Table 1. The Learning Content Expert Instrument Grid

No.	Aspect		Indicator	Item No.
1	Curriculum	a.	Suitability of material to learning outcomes	1
		b.	Suitability of material with learning objectives flow	2
		c.	Suitability of materials to learning objectives	3
2	Material	a.	The concepts presented are in accordance with the material	4
		b.	Completeness of materials	5
		c.	Suitability of materials to student characteristics	6
		d.	Easy to understand material	7
		e.	Depth of material	8
		f.	The material is supported by appropriate media	9
3	Linguistics	a.	The language used is appropriate to the characteristics of the students	10
		b.	Use of appropriate and consistent language	11
4	Evaluation	a.	Suitability of questions to learning materials	12
		b.	The questions given are easy to understand	13
		c.	Suitability of the level of difficulty of the questions with the learning objectives	14

Table 2. The Media Learning Expert Instrument Grid

No	Aspect		Indicator	Item No.
1	Technical	a.	Maintainable(can be maintained and managed easily)	1
		b.	Usable(easy to use and simple to operate)	2
		c.	Operational learning multimedia (clear instructions for using the media are available)	3
2	Text	a.	Choosing the right font	4
		b.	Accuracy in selecting text color	5
		c.	Clarity of text	6
3	Navigation Buttons	a.	Accuracy of navigation button selection	7
		b.	Navigation buttons match the material	8
		c.	Presentation of navigation buttons instructions	9
4	Audio and Video	a.	Clarity of voice	10
		b.	Accuracy of music selection	11
		c.	Image clarity	12

No	Aspect	Indicator	Item No.
		d. Accuracy of layout presentation	13
		e. Media color matching	14
		f. The quality of the images presented	15
		g. Ministry of Finance opening	16
		h. Accuracy of quiz giving	17

Table 3. The Learning Design Expert Instrument Grid

No	Aspect		Indicator	Item No.
1	Appearance	a.	Clarity of Game Instructions	1
		b.	Accuracy of feedback	2
		c.	The attractiveness of the level presentation	3
		d.	The appeal of exercises and games	4
2	Learning	a.	Consistency between objectives, materials, and evaluation in a sequential manner	5
3	Material	a.	Easy to understand presentation of concepts	6
		b.	Quizzes/exercises within the levels can train memory.	7
		c.	Conformity of presentation of material with facts	8
		d.	Suitability of exercises to materials	9
4	Strategy	a.	Supports problem solving skills	10
		b.	Supporting increased student independence and learning motivation	11
		c.	Can improve students' learning knowledge	12
		d.	Train your memory	13
		e.	Accuracy of presentation of difficulty level	14
5	Evaluation	a.	Accuracy of quiz presentation	15
		b.	The exercises can be done repeatedly.	16

Table 4. The Individual, Small Group and Field Scale Test Instrument Grids

No.	Aspect		Indicator	Item No.
1	Interest	a.	Media appeal	1.2
		b.	Media design quality	3.4
		c.	Media presentation quality	5
2	Material	a.	Ease of material	6
		b.	Clarity of material evaluation design	7.8
3	Language and technical	a.	Using easy to understand language	9
		b.	Use of instructions	10
		c.	Audio clarity	11
		d.	Quality of design elements	12,13,14

Table 5. The Pretest and posttest instrument grid

Learning Outcomes	Question Indicator	Cognitive Level
Identifying, understanding and writing words and sentences related to hanging and hanging Balinese script, hanging script, and installing Balinese script pages.	Students understand the types of hangers and hangings, the types of letters, the types of letters, the types of letters	C2
	Students identify the types of hangers and pendants, attach the letters to the letters, and hang the letters.	C3
	Students write words using hangers and gempelan, attach the letters ra repa and lalenga, the letter holder	C4

3. RESULT AND DISCUSSION
Result
The presentation of the research results is presented in three parts, namely describing the process or design of educational game media development, the validity of educational game media development, and the effectiveness of educational game media development in Balinese language subjects for grade IV at SD Mutiara Singaraja.

The design and development of this educational game media is based on the development model used, namely the ADDIE development model. Analyze, at this stage the results of the analysis of the characteristics and learning problems of students are obtained, namely students have difficulty learning due to the lack of learning media that suits their characteristics, resulting in low learning motivation and having an impact on learning outcomes below average, this makes 85% of 20 students agree and are interested in the creation of educational game learning media. In the competency analysis, according to the discussion with the subject teacher, the material discussed is Balinese script, this material was chosen because script is the most difficult topic for students to understand. Furthermore, an analysis of the facilities and student learning environment is carried out, there are school facilities in the form of wifi, computer labs, projectors, and smartphones owned by each student. Design, at this stage a media storyboard is designed by preparing concepts, materials, and software to develop media, designing instruments, and designing teaching modules. Development, at this stage media development is carried out and then testing is carried out on experts and students to determine the validity of the educational game media. Implementation, at this stage the educational game media is implemented on students to measure the effectiveness of the media that has been developed. Evaluation, in this stage, an analysis is carried out on the input and deficiencies of educational game media to determine the feasibility and evaluate the media that has been developed. The appearance of educational game media can be seen in Figure 1.

Figure 1. Opening and Main Page View of Educational Game

The validity of educational game media based on self-regulated learning is carried out through expert tests and product trials to determine the validity and feasibility of educational game media when used in the learning process in the classroom or used for independent learning by students. The results of the validity test are presented in Table 6.

Table 6. The Percentage of results of the validity test of educational game development

No.	Test Subject	Validity Results	Qualification
1	Learning Content Expert Test	92.85%	Very good
2	Learning Design Expert Test	98.75%	Very good
3	Learning Media Expert Test	97.64%	Very good
4	Individual Test	90.33%	Very good
5	Small Group Test	90%	Very good
6	Field Scale Test	91.5%	Very good

Based on Table 6, the validity of the results of the development of educational game media was obtained from the results of the trial of subject matter experts, trials of learning media experts, and trials of learning design experts, individual trials, small group trials and field-scale trials with the questionnaire data collection method. Based on the results of the validity, it can be concluded that this educational game media is declared feasible to be used in the learning process in the Balinese language subject of the Balinese Script material. The effectiveness of the results of educational game development is obtained by looking at the difference in the average of students before using educational game media and after using educational game media, the formula used to see the difference in 2 groups of the same data in this study is the Correlated T Test. Before conducting the T test, a prerequisite test is first carried out, namely the normality and homogeneity test of the data. The results of the normality test are shown in Table 7.

Table 7. The Results of the Pretest Posttest Normality Test

Group	Kolmogorov-Smirnova			Shapiro Wilk		
	Statistics	**df**	**Sig.**	**Statistics**	**df**	**Sig.**
Pretest	0.172	20	0.122	0.928	20	0.144
Posttest	0.192	20	0.052	0.923	20	0.116

Based on Table 7, in the pretest and posttest normality test using the Shapiro Wilk formula, the significance results were 0.144 for the pretest and 0.116 for the posttest, it can be concluded that the significance values of the pretest and posttest> 0.05 so that the data is stated to be normally distributed. Furthermore, the results of the homogeneity calculation using the Fisher test obtained F_{count} = 1.27 while F_{table} = 4.41 with a significance level of 5%, so it can be concluded that F_{count} < F_{table} which means the data has a homogeneous variance. Based on the results of the effectiveness test using the T-test formula on the pretest and posttest data. The results of the t-test analysis are presented in Table 8.

Table 8. Results of t-test Analysis

Data	N	Average	S2 (Variance)	Db	Count	Table
Pretest	20	47.50	64.473	38	9.719	2.024
Posttest		80.75	50.723	38		

Based on Table 8, obtained tcount = 9.719 and t_{table} = 2.024. it can be concluded that t_{count} > t_{table} which means H_0 is rejected and H_1 is accepted. This means that there is a significant difference in student learning outcomes in the Balinese language subject of Balinese script material between before using media and after using educational game media. So, this educational game media is declared effective because it is able to improve student learning outcomes as seen from the increase in the average student learning.

Discussion

Based on the results of the research that has been conducted, the development of educational game media has gone through a series of development processes and has been validated by experts and has been tested on students as test subjects. The validity that has been carried out states that educational game media based on self-regulated learning is declared valid with very good quality and is suitable for use in the Balinese language learning process for fourth grade students of Mutiara Singaraja Elementary School. This is because the research on the development of this educational game uses the ADDIE development model with 5 stages, namely analysis, design, development, implementation and evaluation. Development using the ADDIE model will be effective because this model provides an opportunity for developers to conduct evaluations at each stage, so that it will produce good products (Harefa et al., 2023; Safitri & M.Ridwan Aziz, 2022). Likewise, the very good qualification results obtained in this study were obtained because there was a match between the indicators, objectives and competencies with the material contained in the media so that there was no gap in the material and it was easier for students to receive the information contained therein (Fikri et al., 2021; Zandkarimi., 2013). The concept of gamification contained in the media makes students more motivated and of course attracts students' interest in learning (Ristiana & Dahlan, 2021; Zheng et al., 2024). Features contained in the game such as level presentation, providing feedback, involvement can motivate students and encourage the achievement of desired learning outcomes. (Jääskä et al., 2022; Tresnawati et al., 2023).

Games Self-regulated learning-based education is appropriate for use as a support for the student learning process because it is interesting for students, besides that self-regulated learning is important for success in school, with self-regulated learning individuals are involved in self-determination efforts and are active in planning, carrying out, and evaluating their actions and regulating their behavior, thoughts and feelings to achieve goals (Ebbes et al., 2024; Hertel et al., 2024)]. Self-regulated learning has an important role in achieving individual academic achievement, self-regulated learning also contributes to student success in achieving optimal achievement (Hertel & Karlen, 2021; Xu et al., 2023). In addition, the material presented using an educational game model which contains images, audio and video as components makes the material delivered in an interesting and clearer way so that students can understand the material more easily (Hui et al., 2021; Wira, 2023). The use of visual media can facilitate student understanding, attract interest and strengthen student memory (Kustandi et al., 2021; "The Influence of Audio Visual Media on Learning Outcomes of Grade V Elementary School Students," 2019).

GamesEducation can increase students' enthusiasm for learning. Games have their own appeal to children so that children's enthusiasm for learning can emerge, besides that games have been proven to increase students' creativity, involvement, critical thinking, and problem-solving skills (Gutierrez et al.,

2023; Nugroho & Ma'arif, 2022). The gamification component contained in educational games makes children not easily bored in receiving learning. In addition, growing student interest in the learning process is important. Interest is the beginning of student movement in the learning process which is used to achieve goals that have a big role that affects learning outcomes (Ardiana et al., 2024; Muliani, 2022). When students have an interest in learning within themselves, then they will automatically try to achieve their desires and goals. Learning that is done while playing will create active learning activities, this will certainly encourage a form of meaningful learning (Lindberg, 2020; "Read & Play Media Based on Educational Games to Cultivate Reading Interest in Grade 2 Elementary School," 2022).

The results of previous research stated that developing educational games with the ADDIE model can attract children's interest in learning while playing (Amanda & Putri, 2019; Maulana & Junianto, 2022). Other studies also agree that educational games get a very good response from students (Rizky et al., 2022; Salsabila et al., 2020). It can be concluded that educational games are learning media that can attract students' interest by presenting the concept of learning as something fun so that it can motivate students. The advantages of this educational game media that has been developed are that there are levels with different levels of difficulty and the presentation of quizzes in these levels can increase student retention of previously studied material and can train students' strategy management. The existence of exercises that can be done repeatedly is useful for measuring the results of students' understanding of the material. This educational game media does not need to use an internet network if it is installed on a smartphone, making it easier to access. There is a reward board, which is useful for fostering students' enthusiasm for learning. The division of material is clear and there are instructions on each page of the game, making it easier for students to use the media. And this educational game media uses a self-regulated learning basis where this will indirectly improve students' learning regulation which will have a good impact on students in the learning process.

The components of self-regulated learning in this educational game include, introductory video, the introductory video contains general information about the educational game they will use. With the introductory video, users can prepare and plan their learning activities in advance. Material division, the division of material in the educational game allows users to organize their learning activities well according to their own learning goals. Game instructions, users can instruct themselves in advance so that they can set strategies and goals in their learning activities. Practice, with practice users can conduct self-evaluation in their learning activities. The practice menu is designed with a drag and drop model so that users can try many times and providing an explanation when users succeed in the practice menu will increase user self-evaluation. Badges (rewards or badges that symbolize user achievements), users can monitor the achievement of their learning activities.

Level, the presence of levels in educational games allows users to manage their learning. Users can set whether their learning activities want to be increased if they want to complete all levels. Feedback, giving feedback when users successfully complete the mission in the educational game makes the user's emotional reaction more positive towards what they do. Enemies/opponents in the game, enemies or opponents while playing can make users more observant in making strategies by paying attention to time, speed, and previously learned material in order to win the game. Heart (life), giving the heart component which means the user's life is intended to make users aware of the limits of their game. So that users will be more careful and improve their mastery of strategy. Looking for the key in the game. The existence of victory conditions in the game supports users to create strategies to complete the goals of the game.

The limitation of this study is that it only focuses on one material, namely Balinese Script for grade IV elementary school. In addition, the media is not yet available on download platforms such as the Play Store, so it will be a little difficult for users if they want to download this educational game application. The implication in this study is that it can be used by teachers and students to facilitate the learning process. To perfect educational game media, it is recommended for developers who develop similar products to be able to develop media that have complete components ranging from materials, exercises and evaluations. In addition, it would be very good if the products developed later can be easily accessed by everyone so that the products developed can be useful for many people.

4. CONCLUSION

This self-regulated learning-based educational game media is declared effective based on the results of expert tests and product trials on students with very good qualifications as well as the results of effectiveness tests. It can be concluded that the development of this self-regulated learning-based educational game is feasible to be used during the learning process. This educational game media is able to increase the effectiveness of student learning which has an impact on improving student learning outcomes and can help teachers in facilitating the learning process.

5. REFERENCES

Amanda, D. A., & Putri, A. R. (2019). Pengembangan game edukasi pada mata pelajaran matematika materi bangun datar berbasis android di sdn 1 jepun. *Jurnal of Education and Information Communication Technology*, *03*, 160–168. https://doi.org/https://doi.org/10.29100/joeict.v3i2.1241.

Ambarwati, D., Wibowo, U. B., Arsyiadanti, H., & Susanti, S. (2022). Studi Literatur: Peran Inovasi Pendidikan pada Pembelajaran Berbasis Teknologi Digital. *Jurnal Inovasi Teknologi Pendidikan*, *8*(2), 173–184.

Ardiana, A., Sewtiawan, F., Mirnawati, L. B., Guru, P., Dasar, S., Keguruan, F., Pendidikan, I., & Surabaya, U. M. (2024). Meningkatkan Minat Belajar Siswa Melalui Metode Games-Based Learning (Gbl). *Jurnal Ilmiah Pendidikan Dasar*, *Volume 09*.

Boateng, S. L., Penu, O. K. A., Boateng, R., Budu, J., Marfo, J. S., & Asamoah, P. (2024). Educational technologies and elementary level education – A bibliometric review of scopus indexed journal articles. *Heliyon*, *10*(7), e28101. https://doi.org/10.1016/j.heliyon.2024.e28101.

Byusa, E., Kampire, E., & Rwekaza, A. (2022). Game-based learning approach on students ' motivation and understanding of chemistry concepts : A systematic review of literature. *Heliyon*, *8*(May), e09541. https://doi.org/10.1016/j.heliyon.2022.e09541.

Candra, A. M., & Rahayu, T. S. (2021). Pengembangan Media Pembelajaran Berbasis Game Interaktif untuk Meningkatkan Kemampuan Pemecahan Masalah Tematik di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 2311–2321. https://doi.org/10.31004/basicedu.v5i4.1212.

Dewi, A. C., Salsabila, Jannah, M., Cantika, A. Z., Aurora, F., & Amirah, A. (2023). Menelusuri Jejak Guru Ideal di Era Digital. *PENDIRI: Jurnal Riset Pendidikan*, *1*(1), 1–8. https://ejournal.ranedu.my.id/index.php/pendiri/article/view/11.

Ebbes, R., Schuitema, J. A., Koomen, H. M. Y., Jansen, B. R. J., & Zee, M. (2024). Studies in Educational Evaluation Self-regulated learning : Validating a task-specific questionnaire for children in elementary school. *Studies in Educational Evaluation*, *81*(January), 101339. https://doi.org/10.1016/j.stueduc.2024.101339.

Fikri, M., Zaki Ananda, M., Faizah, N., Rahmani, R., & Adelia Elian, S. (2021). Kendala Dalam Pembelajaran Jarak Jauh Di Masa Pandemi Covid-19: Sebuah Kajian Kritis. *Jurnal Education and Development*, *9*(1), 144–150. https://doi.org/10.37081/ed.v9i1.2290.

Garini, A. W., Respati, R., & Prana, A. M. (2020). Penggunaan Media berupa Digital pada Masa Pandemi di Sekolah Dasar. *Pedadidaktika: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, *7*(4), 186–191. https://doi.org/10.17509/pedadidaktika.v7i4.26558.

Gutierrez, A., Mills, K., Scholes, L., Rowe, L., & Pink, E. (2023). What do secondary teachers think about digital games for learning : Stupid fixation or the future of education ? *Teaching and Teacher Education*, *133*(August 2022), 104278. https://doi.org/10.1016/j.tate.2023.104278.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in educationA review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004.

Hang, Y., Wang, H., Sang, Z., Huang, R., & Ye, L. (2023). The impact of mixed reality serious games on mortise and tenon learning in college students. *Computers & Education: X Reality*, *3*(October 2022), 100042. https://doi.org/10.1016/j.cexr.2023.100042.

Harefa, E. P., Waruwu, D. P., Hulu, A. H., & Bawamenewi, A. (2023). Pengembangan Media Pembelajaran Bahasa Indonesia Berbasis Website dengan Menggunakan Model ADDIE. *Journal on Education*, *06*(01), 4405–4410. https://doi.org/10.31004/joe.v6i1.3581.

Hertel, S., & Karlen, Y. (2021). Implicit theories of self-regulated learning: Interplay with students' achievement goals, learning strategies, and metacognition. *British Journal of Educational Psychology*, *91*(3), 972–996. https://doi.org/10.1111/bjep.12402.

Hertel, S., Reschke, K., & Karlen, Y. (2024). Are profiles of self-regulated learning and intelligence mindsets related to students' self-regulated learning and achievement? In *Learning and Instruction* (Vol. 90). https://doi.org/10.1016/j.learninstruc.2023.101850.

Hu, Y., Wouters, P., van der Schaaf, M., & Kester, L. (2024). The effects of achievement goal instructions in game-based learning on students' achievement goals, performance, and achievement emotions. *Learning and Instruction*, *93*(May), 101943. https://doi.org/10.1016/j.learninstruc.2024.101943.

Hui, L., Bruin, A. B. H., Donkers, J., & Merriënboer, J. J. G. (2021). Stimulating the intention to change learning strategies: The role of narratives. *International Journal of Educational Research*, *107*(February). https://doi.org/10.1016/j.ijer.2021.101753.

Iskandar, S., Rosmana, P. S., & Putri, H. I. (2024). Peran Guru dalam Membangun Lingkungan Belajar yang Positif di Kelas. *Jurnal Pendidikan Tambusai*, *8*(2), 25762–25770. https://ejournal.yasin-alsys.org/index.php/tsaqofah/article/view/2200.

Jääskä, E., Lehtinen, J., Kujala, J., & Kauppila, O. (2022). Game-based learning and students' motivation in

project management education. *Project Leadership and Society*, *3*(July), 1–13. https://doi.org/10.1016/j.plas.2022.100055.

Jørgensen, H. H., & Skovbjerg, H. M. (2024). Play qualities: Playful actions in learning processes in teacher education and social education. *Social Sciences and Humanities Open*, *9*(May 2023), 1–8. https://doi.org/10.1016/j.ssaho.2023.100795.

Kustandi, C., Farhan, M., Zianadezdha, A., Fitri, A. K., & L, N. A. (2021). Pemanfaatan Media Visual Dalam Tercapainya Tujuan Pembelajaran. *Akademika*, *10*(02), 291–299. https://doi.org/10.34005/akademika.v10i02.1402.

Lindberg, R. S. N. (2020). Designing Engaging Games for Education : A Systematic Literature Review on Game Motivators and Design Principles. *IEEE Transactions On Learning Technologies*, *13*(4), 804–821. https://doi.org/10.1109/TLT.2020.3018503.

López-Fernández, D., Gordillo, A., Lara-Cabrera, R., & Alegre, J. (2023). Comparing effectiveness of educational video games of different genres in computer science education. In *Entertainment Computing* (Vol. 47). https://doi.org/10.1016/j.entcom.2023.100588.

López, F. R., Arias-Oliva, M., Pelegrín-Borondo, J., & Marín-Vinuesa, L. M. (2021). Serious games in management education: An acceptance analysis. *International Journal of Management Education*, *19*(3). https://doi.org/10.1016/j.ijme.2021.100517.

Maulana, M. I., & Junianto, E. (2022). Penerapan model addie dalam pembuatan permainan edukasi bahasa inggris. *Jurnal Responsif : Riset Sains Dan Informatika*, *4*(1), 12–22. https://doi.org/10.51977/jti.v4i1.680.

Media Read & Play Berbasis Game Edukasi Untuk Menumbuhkan Minat Baca di Kelas 2 SD. (2022). *Edukasi: Jurnal Penelitian Dan Artikel Pendidikan*, *14*(2), 157–174. https://doi.org/10.31603/edukasi.v14i2.8069.

Miasari, R. S., Indar, C., Pratiwi, P., Purwoto, P., Salsabila, U. H., Amalia, U., & Romli, S. (2022). Teknologi pendidikan sebagai jembatan reformasi pembelajaran di indonesia lebih maju. *Jurnal Manajemen Pendidikan Al Hadi*, *2*(1). http://dx.doi.org/10.31602/jmpd.v2i1.6390.

Muliani, R. D. (2022). Faktor-Faktor yang Mempengaruhi Minat Belajar Peserta Didik. *Jurnal Riset Dan Pengabdian Masyarakat*, *2*(2), 133–139. https://doi.org/10.22373/jrpm.v2i2.1684.

Nguyen, L. T., Kanjug, I., Grichawat, Lowatcharin Theeradej, M., Sarakorn, K. P., Somabut, A., Srisawasdi, N., & Saksuriya Traiyarach, K. T. (2022). *How teachers manage their classroom in the digital learning environment – experiences from the University Smart Learning Project*. https://doi.org/10.1016/j.heliyon.2022.e10817.

Nugroho, A. W., & Ma'arif, S. (2022). Pengembangan Media Game Edukasi "Marbel Fauna" pada Siswa Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 6686–6694. https://doi.org/10.31004/basicedu.v6i4.3326.

Nurillahwaty, E. (2022). Peran Teknologi dalam Dunia Pendidikan. *Jurnal Keislaman Dan Ilmu Pendidikan*, *3*(1), 123–133. https://semnas.univpgri-palembang.ac.id/index.php/prosidingpps/article/view/309.

Oktariyanti, D., Frima, A., & Febriandi, R. (2021). Pengembangan Media Pembelajaran Online Berbasis Game Edukasi Wordwall Tema Indahnya Kebersamaan pada Siswa Sekolah Dasar. *Jurnal Basicedu*, *5*(5), 4093–4100. https://doi.org/10.31004/basicedu.v5i5.1490.

Oktavia, R. (2022). Game Based Learning Meningkatkan Efektivitas Belajar Siswa. *OSF Preprints*, 1–7. https://doi.org/10.31219/osf.io/6aeuy.

Pengaruh media audio visual terhadap hasil belajar siswa kelas v sekolah dasar. (2019). *Jurnal Ilmiah Pendidikan Dasar*, *4*(2), 185–196. Https://Journal.Unpas.Ac.Id/Index.Php/Pendas/Article/Download/2166/1036.

Ratinho, E., & Martins, C. (2023). The role of gamified learning strategies in student's motivation in high school and higher education: A systematic review. *Heliyon*, *9*(8). https://doi.org/10.1016/j.heliyon.2023.e19033.

Ristiana, M. G., & Dahlan, J. A. (2021). Pandangan mahasiswa calon guru dalam penggunaan model gamifikasi dalam pembelajaran matematika. *Jurnal Riset Dan Pengabdian Masyarakat*, *4*(1), 127–136. https://doi.org/10.22460/jpmi.v4i1.127-136.

Rizky, M. R. F., Marhaeni, N. H., & Budiningsih, V. A. (2022). Analisis Respon Siswa Terhadap Penggunaan Game Edukasi Quizizz Dalam Pembelajaran Matematika. *Paedagoria : Jurnal Kajian, Penelitian Dan Pengembangan Kependidikan*, *13*(2), 146. https://doi.org/10.31764/paedagoria.v13i2.10568.

Safitri, M., & M.Ridwan Aziz. (2022). ADDIE Sebuah Model Untuk Pengembangan Multimedia. *Jurnal Pendidikan Dasar*, *3*(2), 50–58. https://jurnal.umpwr.ac.id/index.php/jpd/article/view/2237.

Salsabila, N. H., Novitasari, D., Tyaningsih, R. Y., & Ardani, R. A. (2020). Game edukasi pada pembelajaran matematika: tanggapan siswa SMP berdasarkan gender. *Mathematic Education And Aplication*, *2*(1), 25–32. https://doi.org/10.35334/meta.v2i1.1632.

Sembey, R., Hoda, R., & Grundy, J. (2024). Emerging technologies in higher education assessment and feedback practices: A systematic literature review. *The Journal of Systems & Software*, *37*(3), 183–185. https://doi.org/10.1016/j.jss.2024.111988.

Suhendar, A. W., & Yanto, A. (2023). Pembelajaran Matematika Menyenangkan di SD Melalui Permainan. *Jurnal Pendidikan Matematika*, *2*(1), 18–23. https://doi.org/10.56916/jp.v2i1.316.

Sukatin, Qomariyyah, Horin, Y., Afrilianti, A., Alivia, & Bella, R. (2019). Analisis Psikologi Perkembangan Sosial Emosional Anak Usia Dini. *Bunayya : Jurnal Pendidikan Anak*, *VI*(2), 156–171. https://jurnal.ar-raniry.ac.id/index.php/bunayya/article/view/7311.

Sun, L., Kangas, M., Ruokamo, H., & Siklander, S. (2023). A systematic literature review of teacher scaffolding in game-based learning in primary education. *Educational Research Review*, *40*(June), 100546. https://doi.org/10.1016/j.edurev.2023.100546.

Tegeh & Kirna. (2010). Pengembangan Bahan Ajar Metode Penelitian Pendidikan dengan ADDIE Model. *IKA 2*. https://ejournal.undiksha.ac.id/index.php/IKA/article/view/1145.

Tresnawati, D., Rahayu, S., & Garnisa, S. B. (2023). Penerapan Sistem Gamifikasi pada Learning Management System. *Jurnal Algoritma*, *20*(1), 252–263. https://doi.org/10.33364/algoritma/v.20-2.1299.

Vita-Barrull, N., Estrada-Plana, V., March-Llanes, J., Sotoca-Orgaz, P., Guzman, N., Ayesa, R., & Moya-Higueras, J. (2024). Do you play in class Board games to promote cognitive and educational. *Learning and Instruction*, *93*. https://doi.org/10.1016/j.learninstruc.2024.101946.

Wira, A. S. (2023). Penerapan media pembelajaran berbasis video pada model pembelajaran jarak jauh (PJJ). *Jurnal Pendidikan Agama Islam*, *8*(1), 53–54. https://www.researchgate.net/profile/Rizaldi-Zidane-2/publication/341223962.

Xu, Z., Zhao, Y., Liew, J., Zhou, X., & Kogut, A. (2023). Synthesizing research evidence on self-regulated learning and academic achievement in online and blended learning environments : A scoping review. *Educational Research Review*, *39*(October 2020), 100510. https://doi.org/10.1016/j.edurev.2023.100510.

Zandkarimi., Y. (2013). The Impact of E-learning on some Psychological Dimensions and Academic Achievement. *International Journal of Education and Learning*, *2*(2), 49–56. https://doi.org/10.14257/ijel.2013.2.2.05.

Zheng, Y., Zhang, J., Li, Y., Wu, X., Ding, R., Luo, X., Liu, P., & Huang, J. (2024). Effects of digital game-based learning on students' digital etiquette literacy, learning motivations, and engagement. *Heliyon*, *10*(1), e23490. https://doi.org/10.1016/j.heliyon.2023.e23490.