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Cultural Monopoly Game: Designing and Testing Game-Based Media for Intangible Cultural Heritage Learning in Elementary School

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Abstract: Development of Cultural Monopoly Learning in Intangibel Cultural Heritage Materials Elementary School. Objectives: The ineffective use of learning media and low student learning outcomes are one of the problems found at Kedungjenar Elementary School. This study was conducted with the aim of developing, testing the feasibility, and testing the effectiveness of game-based media, namely cultural monopoly with the material of intangible cultural heritage in the fifth grade. **Methods:** he research method used in this research is R&D (Reasearch and Development) with research design by Borg and Gall. Data collection techniques using tests (pretest and posttest), with non-test techniques (observation, interviews, questionnaires, and documentation). **Findings:** The results showed that the media was feasible to use based on the percentage of assessments from media experts and material experts of 90,15% with a very feasible category. The analysis technique used normality test, t-test, and n-gain test. The results of the data normality test showed a sig value. > 0,05 so that the data is normally distributed. The t-test results obtained 19,270 with sig. <0,05 indicates that there is an increase in learning outcomes before and after using cultural monopoly media. While the results of the N-Gain test obtained an increase in learning outcomes of 0,6498 with moderate criteria. **Conclusion:** With an increase in the average, it can be concluded that the cultural monopoly learning media on intangible cultural heritage material is effectively used in fifth grade elementary school.

Keywords: learning media, monopoly game, intangible culture.

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INTRODUCTION

Currently, the global world is paying attention to quality education due to changes in increasing knowledge and technological advances (Donkoh et al, 2022). Quality education is various plans and reforms of educational institutions that have the aim of achieving efficiency and effectiveness by complying with established standards (Pedraja-Rejas et al, 2020). Quality education includes learning resources, technology, programs, teaching methodology, professional qualifications of teaching staff, as well as teacher and student perspectives on educational assessment (Thangeda et al., 2016). Quality education can influence a person's mindset so that it will influence the way they live and the decisions they make. According to psychology, learning occurs when subjects change, which shows that they have understood and applied what has been taught (Donkoh, et al. 2023). One method used is to apply an active learning methodology that focuses on students. According to Kamarudin et al (2019), the level of student interest in learning is low when teachers use conventional

approaches. As a result, teachers must use the most effective methods to impart knowledge. Learning outcomes relate to cognitive aspects involving knowledge and intellectual development. There are several main categories of cognitive processes, namely knowledge, understanding, application, analysis and evaluation (Alshammari, 2019).

Active learning methodology is widely known as a pedagogical process that involves students in learning activities to stimulate cognitive abilities and encourage deeper learning (Hartt et al, 2020). The use of active learning methodology in learning can build knowledge and skills, increase student participation (Bolivar-Ramos & Martínez-Salgueiro, 2018), increase motivation (Kroeger, 2018; Calza-Perez et al., 2024), strengthen engagement (Buil et al., 2020), increasing student concentration (Silva et al, 2019), fostering the enjoyment of peer interaction, and the ability to share ideas (Hartt et al, 2020). Learning that requires active student participation can create deep learning if combined with interesting components that support student learning (Haili-Kari et al, 2022). However, there are challenges regarding student involvement in active learning, namely lack of guaranteed learning motivation among students so that learning outcomes are low. To increase student motivation in learning and involve students in active learning, active learning must be combined with games (Hollander & Thomas, 2009). Game-based learning methods are often defined as the use of game design elements in non-game environments (Deterding, et al, 2011: Hartt, et all 2020). A game-based learning approach refers to the use of games, game interactions and game design that are used to provide student motivation in learning (Buckley & Doyle, 2016).

Games are an activity that is fun and can provide motivation, especially for children and teenagers (Bang et al., 2023; Kordaki, 2011; McFarlane & Sakellariou, 2002; So et al., 2019). Game activities provide opportunities for children to explore problems by utilizing innovation (Ilten-Gee & Hilliard, 2021). Games that are used for educational purposes and have learning materials will make learning more fun, interesting and effective (Bang et al., 2023; Kafai & Ching, 2001; Prensky, 2001; Tsai et al., 2020). The use of games for educational purposes can provide motivation for student involvement in learning, thereby influencing emotional, social and cognitive development (Bang et al., 2023; Bragg, 2012; DeVries, 2002). The application of games in education is attracting increasing attention (Sun et al., 2021; Meletiou-Mavotheris & Prodromou, 2016). The content in learning games can help students gain knowledge and develop skills, while the activities in games can help students solve problems and challenges and provide a sense of achievement (Kay & Kwak, 2018; Qian & Clark, 2016; Wen, 2018). Game-based learning is based on five characteristics, namely: (1) using actions to explain something, (2) being able to create motivation and personal satisfaction, (3) creating various learning styles and learning skills, (4) strengthening skill mastery, and (5) providing interactive activities and decision-making analysis (Charles & McAlister, 2004; Holand et al., 2003; Kebrichi & Hirumi, 2008; Sun, 2023). In basic education, the application of game-based learning has a good influence on the knowledge and skills of students aged 6 to 13 years (Sun, et al. 2021). The benefits provided by game-based learning in basic education are helping students to be enthusiastic about learning and improving their academic skills (Sun et al., 2022; Baek & Touati, 2020; Hainey et al., 2016; Hsu & Wang, 2018).

Game-based learning must of course be balanced with the teacher's ability to lead the learning. During learning, the teacher acts as a facilitator who directs the learning process and helps students solve the problems they face in acquiring knowledge and skills (Chuang et al. 2021, Haruehansawasin & Kiattikomol, 2018;

Liu et al., 2018). The interactions carried out by teachers during learning include leading discussions, asking questions, explaining games related to practical methods, providing feedback, offering guidance, and providing strategic support to students (Huang et al., 2020; So et al., 2019). The teacher's role is not only as a facilitator but also as a guide whose main task is to provide appropriate support when students face problems. Apart from that, teachers play a role in integrating games into learning materials (Hermkes et al. 2018; Wen, 2018; So et al., 2019). Therefore, the role of teachers and student involvement is very important for students' academic achievement (Lei et al, 2022). Teachers can direct and motivate students to carry out collaborative dialogue so that students can work together to solve problems (Liu et al, 2021). Collaboration between students can create a positive relationship with learning outcomes in acquiring knowledge and skills (Abahhusain 2020).

Researchers had the opportunity to carry out observations at one of the elementary schools in Blora Regency, Central Java, Indonesia. Observations were carried out in fifth grade, precisely at Kedungjenar elementary school. After observation, researchers conducted interviews with teachers and students regarding the learning that took place. Some of the problems experienced are low student learning outcomes, lack of enthusiasm for learning, and less than optimal use of learning media. Learning resources only come from books and teachers only use the lecture method so students feel bored. This kind of problem is often experienced by students, especially in material that discusses cultural heritage, students only listen and listen to the teacher delivering the material. So researchers are interested in helping solve the problem by proposing learning using play media, namely monopoly.

The monopoly game used as a learning medium is expected to create more active, innovative, creative, effective, enjoyable learning and provide optimal results in achieving learning goals (Akbar et al., 2022). Based on research conducted by Putra et al. (2020), monopoly is a game that is relatively popular, easy to play, and can attract students' attention. Student attention is one of the main keys to facilitating understanding of the material being taught, so that student achievement will increase. Other research conducted by Kadek & Kartika (2021) revealed that monopoly media is suitable for use in learning because it can increase student enthusiasm and create effective learning conditions. Other research conducted by Aryani (2019); Masruri et al., (2020) also revealed that education-based media, namely the monopoly game, can have a positive impact and provide a new atmosphere for students, thereby increasing learning achievement.

METHOD

Research Design and Procedures

The type of research used is development research (*Research and Development*). The model design used in this research is a development research design *Borg and Gall* which has stages, namely potential and problems, data collection, product design, design validation, product testing, product revision, usage trials (Sugiyono, 2016). The first step is to analyze existing problems using observation during classroom learning. To obtain qualitative data, interviews were conducted with teachers regarding the methods and sources used in learning as well as interviews with students regarding classroom learning. The questionnaire contains questions regarding the learning needs in the class they want. Based on the results of observations, interviews and filling out questionnaires, further analysis of the problems and solutions that will be provided can be analyzed. Product designs are made based on the needs of teachers and students during learning by taking into account the assessments of material experts and media

experts. The research was carried out for six months until monopoly media could be used in large-scale trials.

Research Instruments

The instruments used in the research were tests and non-tests. The test instrument can be questions that are relevant to individual students. The type of cognitive test used in this research consisted of 25 multiple choice questions. After implementing the validity of the questions at a level of 5%, it was discovered that 5 questions were invalid so that only 20 questions had good validity. The calculation of the reliability value of the questions was obtained at 0,86872 with a sig level. 5%, then it can be seen that the cognitive test questions are declared reliable. The cognitive test contains material on intangible cultural heritage for the fifth grade of elementary school, covering forms of intangible cultural heritage, cultural origins, factors causing cultural diversity, and the relationship between cultural forms and everyday life. The questions presented build students' understanding, application, analysis and synthesis. Trial use of cultural monopoly media using experimental methods *noneequivalent control group design*. The pretest and posttest results will be compared to analyze the differences.

Non-test instruments include observation, interviews and filling out questionnaires. Observations are carried out in the form of observing teachers and students during learning activities. The interview was carried out in a structured manner with several questions given to teachers and students which contained learning resources, the teacher's way of teaching, the classroom atmosphere during learning, and the feelings felt when learning took place. The questionnaire instruments used were teacher and student needs questionnaires, material and media suitability validation questionnaires, and teacher and student response questionnaires.

Data Analysis

The data analysis used is initial data analysis and final data analysis. Initial data analysis was carried out descriptively including analysis of needs questionnaires and teacher and student response questionnaires. Teacher and student needs questionnaires are used to help develop monopoly media products for intangible cultural heritage materials. The results of the questionnaire analysis of teacher and student needs include monopoly media measuring A3 (29,7 x 42 cm) with attractive colors and images, group learning with games, and the language used is good and correct Indonesian. Then analyze the questionnaire responses from teachers and students to assess the feasibility of monopoly media products. Meanwhile, the final data analysis is in the form of calculating data on students' cognitive learning outcomes before and after using monopoly media. Final data analysis using SPSS, with normality test calculations, t tests, and n-gain tests. The normality test aims to determine that the data is normally distributed. The t test aims to determine the increase in students' pretest and posttest results regarding the use of monopoly media by using the paired sample t test formula. The n-gain test aims to measure the increase in the average value of fifth grade students before and after using monopoly media.

The students who became the research subjects were fifth grade students of Kedungjenar elementary school, Blora Regency, totaling 28 students. Data were obtained from interviews and observations of teachers and students in the classroom. Product feasibility assessment was carried out by material experts and media experts on cultural monopoly media. Students and teachers also carried out product assessment through questionnaires. Product trials of monopoly media were carried out using the experimental method of one group pretest-posttest design, namely by giving tests in the form

of multiple choice before and after using cultural monopoly media. The data analysis technique uses product data analysis, initial average analysis and final data analysis. Initial data analysis can be calculated using descriptive analysis and normality test. Final data analysis can be calculated using the t test and N-gain test.

■ RESULT AND DISCUSSION

Result

Cultural Monopoly Media Design

The cultural monopoly media design has the following parts, namely a monopoly board, pawns, surprise cards, case cards, dice, and a cultural monopoly game guidebook. Monopoly boards are made from 2mm thick acrylic with A3 size, namely 29,7 x 42 cm. The monopoly base design created using the Canva application has 54 plots with each plot depicting a province in Indonesia and the names of the provinces. Monopoly game cards consisting of surprise cards and case cards. The card is made from art paper with dimensions of 8cm x 4cm. The cards contain questions and challenges that players must answer. In this game pawns are used to represent the student's steps and dice are used to determine the number of steps that must be taken. Apart from that, the cultural monopoly game is also equipped with a guidebook so that the playing process complies with the rules in the book. The guidebook is made in A5 size (14,8 cm x 21 cm) using art paper. The overall design of monopoly media is made by paying attention to colors, images and writing that are attractive to children. The results of the media design can be seen in Figure 1.

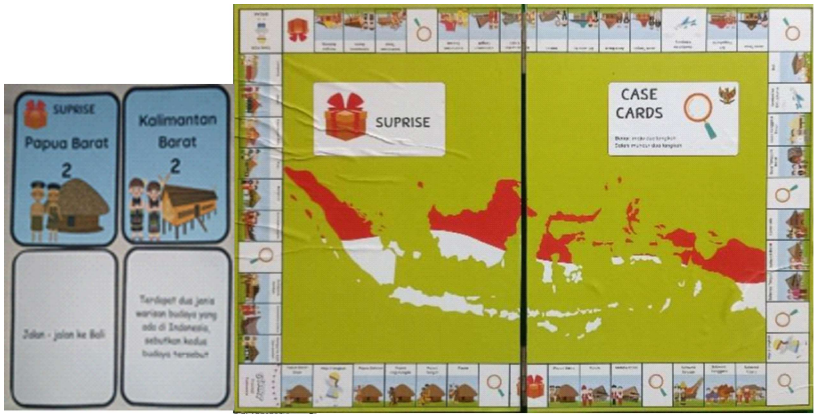

Figure 1. Monopoly media

Cultural Monopoly Media Qualifications

The feasibility of monopoly media includes assessment by media experts and material experts. Firstly, an assessment in the media suitability aspect by Mr. Moh. Faturrahman, S.Pd. M.Sn. Second, assessment in the aspect of material suitability by Mrs. Panca Dewi Purwati, M.Pd. The results of the validation assessment by material experts and media experts are shown in Table 1.

Table 1. Recapitulation of media and material expert assessments

Assessment Aspects	Maximum Score	Score Earned	Presentation	Criteria
Media	68	60	88.24%	Very Worth It
Material	64	59	92.18%	Very Worth It
Overall Score	132	119	90.15%	Very Worth It

Based on the recapitulation of assessment results by media experts and material experts, it is known that the monopoly media product assessment score was obtained at 119 with a percentage of 90,15% which is included in the very feasible category. Thus, it can be concluded that the cultural monopoly product has fulfilled the aspects of a learning media, so cultural monopoly with intangible cultural heritage material for the fifth grade at SDN Kedungjenar Blora is very suitable for use in learning.

Furthermore, small-scale trials were also carried out to assess the feasibility of cultural monopoly products. A small-scale trial was carried out involving 8 students. The results of the student response questionnaire on a small scale showed that from a maximum score of 138, a score of 131 was obtained. The percentage obtained was 94,93% with a very decent category. The results of the teacher response questionnaire showed that from a maximum score of 17, a score of 16 was obtained. The percentage obtained was 94,11% with a very decent category. Based on the responses given to students and teachers, cultural monopoly media is very suitable for use in learning activities.

The Effectiveness of Cultural Monopoly Media

To determine the effectiveness of cultural monopoly media, data analysis can be done using SPSS through the normality test, homogeneity test, t test, and N-gain test. Table 2 presents the data normality test in this study.

Table 2. Normality test

Tests of Normality							
	Group	**Kolmogorov-Smirnov[a]**			**Shapiro-Wilk**		
		Statistic	**df**	**Say.**	**Statistic**	**df**	**Say.**
Results	Pre-test A (control)	.141	28	.162	.935	28	.083
	Post-test A (control)	.215	28	.002	.911	28	.021
	Pre-test B (exsperiment)	.161	28	.060	.947	28	.165
	Post-Test B (exsperiment)	.165	28	.049	.911	28	.021
a. Lilliefors Significance Correction							

This research uses a normality test using the Shapiro-Wilk formula with a significance value of 0,05. From the test results, it can be seen that each data has a different significance value. The pre-test data for the control class has a significance of 0,083, the post-test data for the control class has a significance of 0,21. The experimental class pre-test data has a significance of 0,165, the experimental class post-test data has a significance of 0,21. Based on these results, it can be seen that the data used is normally distributed and has a significance level of more than 0,05. So it can be concluded that the pre-test and post-test data in the control class and experimental class are normally distributed data. Next, the data is calculated using a homogeneity test to determine that the data comes from the same variance. The homogeneity test is calculated using SPSS with the following calculations.

Table 3. Homogeneity test

Test of Homogeneity of Variance					
		Levene Statistic	**df1**	**df2**	**Say.**
Pretest	Based on Mean	.105	1	54	.747
	Based on Median	.165	1	54	.686

	Based on Median and with adjusted df	.165	1	53.267	.686
	Based on trimmed mean	.107	1	54	.745
Posttest	Based on Mean	3.235	1	54	.078
	Based on Median	3.066	1	54	.086
	Based on Median and with adjusted df	3.066	1	53.195	.086
	Based on trimmed mean	3.387	1	54	.071

Based on the calculations in table 3, the average pre-test value and average post-test value have a significance of 0,747 and 0,78. From this calculation, it can be seen that the average significant value of the pre-test and post-test is greater than the probability value of 0,05 so it can be concluded that the population has a homogeneous variance. Then, to find out the difference in the averages of two related samples, this research used a test *paired sample t test.* This test was carried out to determine whether there were differences in learning outcomes regarding learning before using media and learning using cultural monopoly media. The data used for the paired sample t test uses pre-test and post-test data from the control class without using cultural monopoly media (pair 1) as well as pre-test and post-test data from the experimental class which uses cultural monopoly media (pair 2). The paired sample t test can be seen in table 4.

Table 4. Paired sample T test

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	Pretest - Posttest	-18.393	9.433	1.783	-22.051	-14.735	-10.317	27	<.001	<.001
Pair 1	Pretest - Posttest	-26.786	7.355	1.390	-29.638	-23.934	-19.270	27	<.001	<.001

Based on table 4, it can be seen that the two-sided p significance value obtained from pair 1 (control class) is <,001. Meanwhile, the two-sided p significance value obtained from pair 2 (experimental class) was <,001. From the two two sided p significance values for the control class and the experimental class, it can be concluded that each pair of classes has a significant difference in the average student learning outcomes because the significance value in each class is more than 0,05. Next, to determine whether or not there is a difference in the average of two independent samples (control class and experimental class) based on the data after the test, an independent sample t test was carried out. To calculate the independent sample t test, it must be ensured that the data is normally distributed and also has a homogeneous variance. From statistical analysis, this research data is normally distributed and homogeneous so that the results of the independent sample t test can be seen in table 5.

Based on the test results in table 5, it can be seen that the significance value of two-sided p is <,001. If the sig value. Two sided p <0,05 means there is a difference design validation which is significant in the learning outcomes of the control class and experimental class. It can be

Table 5. Independent sample t test results

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Say.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
Learning outcomes	Equal variances assumed	3.235	.078	-5.112	54	<.001	<.001	-10.000	1.956	-13.922	-6.078
	Equal variances not assumed			-5.112	51.013	<.001	<.001	-10.000	1.956	-13.927	-6.073

concluded that the learning outcomes of the control class and the experimental class have significant differences. The next analysis is to test the effectiveness of using cultural monopoly media on fifth grade intangible cultural heritage material using the N-Gain test. In this research, students' cognitive aspects were assessed by paying attention to the 4 indicators observed, namely understanding, application, analysis and synthesis. Measuring the effectiveness of using monopoly media is presented in Figure 2.

Based on Figure 2, it can be seen that the N-Gain test analysis was carried out on each cognitive aspect observed, namely

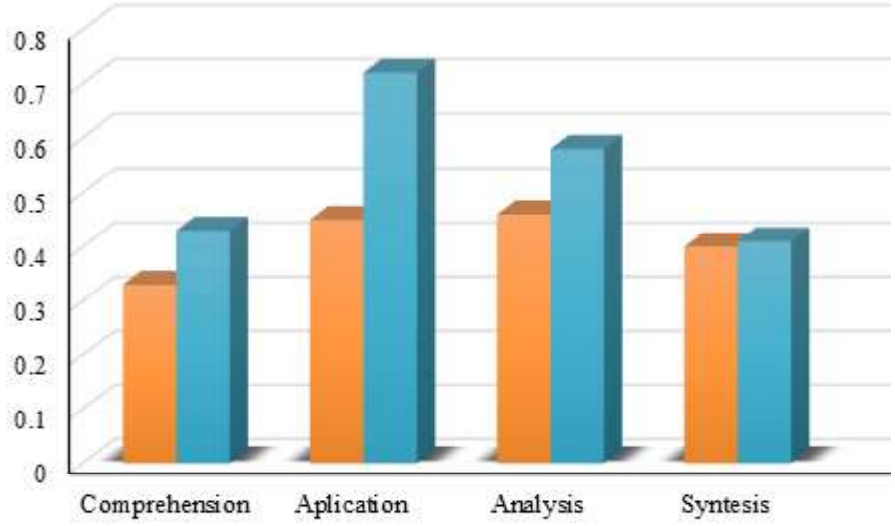

Figure 2. Cognitive indicator n-gain test diagram

comprehension, application, analysis and synthesis in the control class and experimental class. In the control class which used conventional learning without media, the N-Gain comprehension value was 0,33; application 0,45; analysis 0,46; and synthesis 0,40. Meanwhile, the experimental class that used learning with media obtained an N-Gain comprehension score of 0,43; application 0,72; analysis 0,58; and synthesis 0,41. From the N-Gain value data for

the control class and experimental class, it can be seen that there is an increase in every aspect observed. The highest increase in N-Gain value was obtained in the application aspect, while the lowest increase in N-Gain value was in the synthesis aspect. The average N-Gain value of the control class is 0,41 while the experimental class is 0,54 in the medium category, so it can be concluded that the use of cultural monopoly media in intangible cultural heritage material is quite effective in improving student learning outcomes, especially in the application aspect.

Discussion

This development research produced a learning media product in the form of a cultural monopoly on intangible cultural heritage material for the fifth grade of elementary school. Research development (RnD) with the Borg and Gall model. The implementation of this research used stages, namely potential and problems, data collection, product design, design validation, product testing, product revision, usage trials Initial data collection using observations and interviews about ongoing learning. The data that has been obtained is analyzed and carried out further review. Based on the data that has been obtained, researchers plan the development of learning products. In the next stage, the appropriateness of the media is assessed by media and material experts and the media is assessed in small groups. Then improvements are made to the media which has been tested for suitability to make it better. The final stage is the use of learning by applying cultural monopoly media to students. Students were divided into two class groups, namely the control class and the experimental class. Each class will be divided into several groups to carry out cultural monopoly game-based learning.

Based on the research results, it can be seen that the use of game-based learning media has an effect on student learning outcomes. This is due to the application of learning media using games and collaborating with student-centered active learning. In line with research (Siong & Osman, 2018) which states that game-based learning is proven to improve student learning achievement because it emphasizes collaborative learning between teachers and peers through conversation and problem solving. It is also supported by research (Cheung et al, 2021) that the combination of learning with games can increase student motivation so that the learning outcomes obtained improve, but game-based learning must pay attention to content, design and problem solving steps. Apart from improving learning outcomes, game-based learning can also increase interest, participation, and allow students to be more deeply involved in learning (Laine & Lindberg, 2020). Game-based learning media will influence many aspects of students if it is developed well and collaborated with the right steps.

From the results of the research data, it can be seen that cultural monopoly media on intangible heritage materials is suitable for use and effective in implementation in the fifth grade of elementary school. This was obtained from feasibility assessment data by material and media experts of 90,15% (very feasible). The assessment of the feasibility of this cultural monopoly is seen from the design, colors and attractive images. Learning media is said to be appropriate if it meets the attractive criteria, in accordance with research conducted by Suciati (2015) in her research, namely the development of language monopoly media where user attraction, effectiveness and suitability of the media must have good qualifications. Apart from that, an attractive media design will make it easier for students to remember and absorb learning material so they can focus more on learning (Arif, 2019). Elementary school age students really enjoy learning by playing together.

The use of cultural monopoly media in fifth grade intangible heritage material can influence students' cognitive aspects. As is known, students'

cognitive aspects include knowledge, understanding, application, analysis, synthesis and evaluation (Alshammari, 2019). The data obtained in this research states that there is an increase in students' understanding, application, analysis and synthesis after learning using cultural monopoly media. The increase in each cognitive aspect is different, it can be seen from the calculation of the average N-Gain value for the control class, 41%, while for the experimental class, it is 54% in the medium category. Apart from cognitive engagement, this game-based media can also make learning fun and interactive and foster student interest and involvement (Daeng et al, 2020). In line with this, research by (Freitas et al, 2017) argues that game-based learning has the potential to improve advanced cognitive skills such as reasoning, critical thinking, and problem solving. It has been proven by research by (Indriani et al, 2019) that problem-based learning with the help of monopoly media can improve critical thinking skills. So the development of monopolo media can help students create a pleasant learning atmosphere and help improve their learning outcomes.

CONCLUSION

The development of cultural monopoly media is one way to implement student-centered game-based learning. Based on the results of the field test, the feasibility of monopoly media is 90,15% which is included in the very feasible category with several improvements. The difference in learning outcomes in the control class and the experimental class shows that cultural monopoly media can help improve student learning outcomes. This can be seen through the t test which shows that the pretest and posttest scores in the control class and experimental class are different. The cognitive assessment in this research uses evaluation questions in the form of multiple choices by paying attention to indicators of understanding, application, analysis and synthesis. From the N-Gain test, the results showed that learning with monopoly media containing intangible cultural heritage material was effective and could improve students' understanding, application, analysis and synthesis. This is proven by the results of the values for each indicator in the control class and experimental class. The understanding category experienced an increase of 10%, application 27%, analysis 12%, and synthesis 1%, while the average N-Gain test for the control class was 0,41 and the experimental class was 0,53. It can be concluded that the cultural monopoly media on intangible cultural heritage material applied in fifth grade is effectively used.

Viewed from the assessment aspect, cultural monopoly media can be an alternative for improving student learning outcomes, student motivation to learn, and improving discussion skills. Based on interviews with students, the application of cultural monopoly media has an attractive appearance and the learning process in class is fun so that students are enthusiastic about learning and solving problems during learning. Based on field trials that have been carried out, students are less interested in the simple and regular pawn shape so it needs to be improved again. Several obstacles were also found, namely the size of the monopoly board was not large enough so that students played in an uncomfortable position, so improvements needed to be made. Apart from that, the material presented is less specific so that many students not focus.

REFERENCES

Abahussain, M. O. (2020). Investigating EFL learners' perceptions of collaborative writing. International Journal of English Linguistics, 10(3), 32-47.

Alshammari, M. T. (2019). Design and learning effectiveness evaluation of gamification in e-learning systems. *International Journal*

of Advanced Computer Science and Applications, *10*(9).

Arif, M. F., Praherdhiono, H., & Adi, E. (2019). *Pengembangan video pembelajaran ipa materi gaya untuk siswa sekolah dasar* [development of style material science learning videos for elementary school students] . *Jurnal Kajian Teknologi Pendidikan*, *2*(4), 329-335.

Baek, Y., & Touati, A. (2020). Comparing collaborative and cooperative gameplay for academic and gaming achievements. Journal of Educational Computing Research, 57(8), 2110-2140.

Bang, H. J., Li, L., & Flynn, K. (2023). Efficacy of an adaptive game-based math learning app to support personalized learning and improve early elementary school students' learning. Early Childhood Education Journal, 51(4), 717-732.

Bolívar-Ramos, M. T., & Martínez-Salgueiro, A. (2018). Team-based learning in business courses: The application of case studies and simulation games. REIRE: revista d'innovació i recerca en educació, 11(2), 96-109.

Bragg, L. A. (2012). Testing the effectiveness of mathematical games as a pedagogical tool for children's learning. International journal of science and mathematics education, 10, 1445-1467.

Buckley, P., & Doyle, E. (2014). Gamification and student motivation. Interactive Learning Environments, 24(6), 1162–1175. https://doi.org/10.1080/10494820.2014.964263

Buil, I., Catalán, S., & Martínez, E. (2020). Engagement in business simulation games: A self system model of motivational development. British Journal of Educational Technology, 51(1), 297-311.

Calza Perez, M., Perez Ruiz, P., Enri Peiró, S., Martínez Climent, C., & Sánchez García, J. (2024). Key factors influencing knowledge acquisition through game based learning. Psychology & Marketing, 41(5), 1045-1059.

Charles, D., & McAlister, M. (2004, September). Integrating ideas about invisible playgrounds from play theory into online educational digital games. In International Conference on Entertainment Computing (pp. 598-601). Berlin, Heidelberg: Springer Berlin Heidelberg.

Cheung, S. Y., & Ng, K. Y. (2021, March). Application of the educational game to enhance student learning. In *Frontiers in Education* (Vol. 6, p. 623793). Frontiers Media SA.

Chuang, T.-Y., Yeh, M. K.-C., & Lin, Y.-L. (2021). The Impact of Game Playing on Students' Reasoning Ability, Varying According to Their Cognitive Style. Educational Technology & Society, 24(3), 29–43. https://www.jstor.org/stable/27032854

de Vries, E., & de Villiers, P. J. (2002). Dr. Thys von Mollendorff: a matter of professional loyalty-" to the patient or to Gaesar?". South African Family Practice, 25(3).

Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. *British Journal of Educational Technology*, *51*(1), 245-262.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011) From game design elements to gameful- ness: defining 'gamification', in: Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, pp. 9–15 (New York, NY: ACM Press).

Donkoh, R. Donkor, Josephine. Twerefoo, Portia Oware. Lee, Wing On. Boateng, Solomon A. (2022). "Lifelong learning towards the achievement of environtment and

sustainable development in Ghana". International Journal of Educational Development in Africa, 7(1), 2312-3540.

Donkoh, R., Twerefoo, P. O., Donkor, J., Boateng, S. A., & Lee, W. O. (2022). Lifelong learning towards the achievement of environment and sustainable development in Ghana. International Journal of Educational Development in Africa, 7(1), 20-page

Freitas, S. A. A., Lacerda, A. R., Calado, P. M., Lima, T. S., & Canedo, E. D. (2017, October). Gamification in education: A methodology to identify student's profile. In *2017 IEEE Frontiers in Education Conference (FIE)* (pp. 1-8). IEEE.

Hailikari, T., Virtanen, V., Vesalainen, M., & Postareff, L. (2022). Student perspectives on how different elements of constructive alignment support active learning. Active Learning in Higher Education, 23(3), 217-231.

Hainey, T., Connolly, T. M., Boyle, E. A., Wilson, A., & Razak, A. (2016). A systematic literature review of games-based learning empirical evidence in primary education. Computers & Education, 102, 202-223.

Hartt, M., Hosseini, H., & Mostafapour, M. (2020). Game on: Exploring the effectiveness of game-based learning. Planning Practice & Research, 35(5), 589-604.

Haruehansawasin, S., & Kiattikomol, P. (2017). Scaffolding in problem-based learning for low-achieving learners. The Journal of Educational Research, 111(3), 363–370. https://doi.org/10.1080/00220671.2017.1287045

Hermkes, R., Mach, H., & Minnameier, G. (2018). Interaction-based coding of scaffolding processes. Learning and Instruction, 54, 147-155.

Holland, W., Jenkins, H., & Squire, K. (2013). Theory by design. In The video game theory reader (pp. 25-46). Routledge.

Hollander, J. B., & Thomas, D. (2009). Commentary: Virtual planning: Second life and the online studio. Journal of planning education and research, 29(1), 108-113.

Hsu, C. C., & Wang, T. I. (2018). Applying game mechanics and student-generated questions to an online puzzle-based game learning system to promote algorithmic thinking skills. Computers & Education, 121, 73-88.

Huang, M. C. L., Chou, C. Y., Wu, Y. T., Shih, J. L., Yeh, C. Y., Lao, A. C., ... & Chan, T. W. (2020). Interest-driven video creation for learning mathematics. Journal of Computers in Education, 7, 395-433.

Ilten-Gee, R., & Hilliard, L. J. (2019). Moral reasoning in peer conversations during game-based learning: An exploratory study. Journal of Moral Education, 50(2), 140–165. https://doi.org/10.1080/03057240.2019.1662775

Indriani, M. N., Isnarto, I., & Mariani, S. (2019). The implementation of PBL (problem based learning) model assisted by monopoly game media in improving critical thinking ability and self confidence. *Journal of Primary Education*, *8*(2), 200-208.

Kadek, N., & Kartika, D. (2021). *Media Permainan Monopoli Pada Muatan PPKn Siswa Kelas IV Sekolah Dasar* [Monopoly Game Media on PPKn Content for Grade IV Elementary School Students]. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *5*(1), 79–75. https://ejournal.undiksha.ac.id/index.php/JJL/index

Kafai, Y. B., & Ching, C. C. (2001). Affordances of collaborative software design planning for elementary students' science talk.

Journal of the Learning Sciences, 10(3), 323–363. https://doi.org/10.1207/S15327809JLS1003_4

Kamarudin, H., Abdul Malek, N. A., Ayub, S. A. A., Mohamad Ghazali, I., & Wan Mohamed, W. N. (2018). Powertoon clues. *International Journal of Modern Languages and Applied Linguistics (IJMAL)*, *2*(3), 30-34.

Kay, R., & Kwak, J. Y. (2018). Comparing types of mathematics apps used in primary school classrooms: an exploratory analysis. Journal of Computers in Education, 5, 349-371.

Kebritchi, M. (2008). Examining the pedagogical foundations of modern educational computer games. Computers & Education, 51(4), 1729-1743.

Kordaki, M. (2011). A computer card game for the learning of basic aspects of the binary system in primary education: Design and pilot evaluation. Education and Information Technologies, 16, 395-421.

Kroeger, S. (2018). Realising the potential of EU simulations–practical guidance for beginners. European Political Science, 17, 161-175.

Laine, T. H., & Lindberg, R. S. (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.

Lei, Z., Ren, S., Hu, Y., Zhang, W., & Chen, S. (2022, October). Latency-aware collaborative perception. In European Conference on Computer Vision (pp. 316-332). Cham: Springer Nature Switzerland.

Liu, M. C., Huang, Y. M., & Xu, Y. H. (2018). Effects of individual versus group work on learner autonomy and emotion in digital storytelling. Educational technology research and development, 66, 1009-1028.

Liu, S., Kang, L., Liu, Z., Fang, J., Yang, Z., Sun, J., ... & Hu, M. (2023). Computer-supported collaborative concept mapping: The impact of students' perceptions of collaboration on their knowledge understanding and behavioral patterns. Interactive Learning Environments, 31(6), 3340-3359.

McFarlane, A., & Sakellariou, S. (2002). The role of ict in science education. Cambridge Journal of Education, 32(2), 219–232. https://doi.org/10.1080/0305764022000147568

Meletiou-Mavrotheris, M., & Prodromou, T. (2016). Pre-service teacher training on game-enhanced mathematics teaching and learning. Technology, Knowledge and Learning, 21, 379-399.

Pedraja-Rejas, L. M., Marchioni-Choque, Í. A., Espinoza-Marchant, C. J., & Muñoz-Fritis, C. P. (2020). Liderazgo y cultura organizacional como factores de influencia en la calidad universitaria: un análisis conceptual. Formación universitaria, 13(5), 3-14.

Prensky, M. (2001). Digital natives, digital immigrants part 2: Do they really think differently?. On the horizon, 9(6), 1-6.

Qian, M., & Clark, K. R. (2016). Game-based Learning and 21st century skills: A review of recent research. Computers in human behavior, 63, 50-58.

Silva, R., Rodrigues, R., & Leal, C. (2019). Play it again: how game-based learning improves flow in Accounting and Marketing education. Accounting Education, 28(5), 484-507.

Siong, W. W., & Osman, K. (2018). *Pembelajaran berasaskan permainan dalam pendidikan STEM dan penguasaan kemahiran abad ke-21. Politeknik & Kolej Komuniti Journal of Social Sciences and Humanities*, *3*(1), 121-135.

So, W. W. M., Chen, Y., & Wan, Z. H. (2019). Multimedia e-learning and self-regulated science learning: A study of primary school learners' experiences and perceptions. Journal of Science Education and Technology, 28, 508-522.

Suciati, S., Septiana, I., & Untari, M. F. A. (2015). *Penerapan media monosa (monopoli bahasa) berbasis kemandirian dalam pembelajaran di sekolah dasar* [application of independence-based monosa media (language monopoly) in learning in elementary schools.]. *Mimbar Sekolah Dasar*, *2*(2), 175-188.

Sugiyono. (2016). *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.

Sun, L., Chen, X., & Ruokamo, H. (2021). Digital game-based pedagogical activities in primary education: A review of ten years' studies. International Journal of Technology in Teaching and Learning, 16(2), 78-92.

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, 100546.

Sun, L., Ruokamo, H., Kangas, M., & Siklander, P. (2022). Effects of collaborative digital gameplay on students' three dimensions of engagement in mathematics. International Journal of Game-Based Learning (IJGBL), 12(1), 1-16.

Sun, L., Ruokamo, H., Siklander, P., Li, B., & Devlin, K. (2021). Primary school students' perceptions of scaffolding in digital game-based learning in mathematics. Learning, Culture and Social Interaction, 28, 100457.

Thangeda, A., Baratiseng, B., & Mompati, T. (2016). Education for sustainability: quality education is a necessity in modern day. how far do the educational institutions facilitate quality education?. Journal of Education and Practice, 7(2), 9-17.

Tsai, C. Y., Lin, H. S., & Liu, S. C. (2020). The effect of pedagogical GAME model on students' PISA scientific competencies. Journal of Computer Assisted Learning, 36(3), 359-369.

Wen, Y. (2018). Chinese character composition game with the augment paper. Journal of Educational Technology & Society, 21(3), 132–145. http://www.jstor.org/stable/26458513