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Sundanese Traditional Game 'Bebentengan' (Castle): Development of Learning Method Based On Sundanese Local Wisdom

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Abstract: This study seeks to develop a learning method based on local wisdom that is developed to support the learning process. One of the pearls of wisdom used in developing learning methods is the traditional games of the Sundanese people, namely the *Bebentengan* game. This study aims to see the improvement of student learning outcomes by implementing the *Bebentengan* learning method. The mix-method, quantitative data and qualitative data are described based on the research findings. It involves as many as 298 students at various levels; Elementary School (ES), Junior High School (JHS), and Senior High School (SHS) and nine teachers. Data analysis using ANCOVA. The results showed that there was no significant increase in learning outcomes at all levels ($\text{sig. } 0.020 < \alpha$). There is a significant difference in the learning of students who get Sundanese local wisdom-based learning methods at each level (ES, JHS and SHS). Based on the comparison between ES and JHS ($\text{Sig} = 0.079 > \alpha$), can be concluded that the learning method is not effective to be applied in junior high schools. Then, between ES and SHS ($\text{Sig} = 0.006 < \alpha$) so it can be concluded that the learning method is effective to be applied in elementary schools. The last comparison is between JHS and SHS or vice versa ($\text{Sig} = 0.079 > 0.314 > \alpha$), can be concluded that the learning method is not effective to be applied in SHS. Therefore, this method is most effective at the primary level. We find that this learning method can improve student learning outcomes at all levels. Learning methods using local wisdom are effective enough to improve student learning outcomes. Thus, this method can be implemented more broadly. Still, it needs to be developed in the future. It does not rule out the possibility of learning methods based on local wisdom can be combined with technological advances.

Keywords: *Learning methods, Sundanese local wisdom, Bebentengan game, student learning outcomes.*

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Introduction

Local wisdom has the potential to be developed in various fields, especially education. Local wisdom is a characteristic of an area that is thick with culture and the characteristics of everyday people's life. Indonesia has a wealth of local culture that is different in each region. One that is quite well known is the Sundanese tribe in West Java. West Java is famous for its local Sundanese culture, known as the *Bumi Parahiyangan* (place of high-ranking officials). Sundanese culture in West Java is very diverse, ranging from regional arts, livelihoods, folk games, customs, and various dialects. This wealth is, of course, the potential to be developed in multiple fields (Toharudin & Kurniawan, 2018; Tusriyanto, 2020).

Local wisdom is believed to be able to build the character of an area so that it has unique characteristics for each region. In Indonesia, the government seeks to build character education that integrates into the national education curriculum. Seeing that there is great potential in local wisdom to build student character, it is quite relevant if local wisdom integrates into the curriculum. This research tries to develop a learning method that adopts one of the Sundanese folk games, *Bebentengan*. *Bebentengan* is a Sundanese folk game played in groups. The philosophy of teamwork is teamwork, confidence, speed, accuracy, vigilance, responsibility, and empathy. Thus, we believe that the *Bebentengan* game can form the character of students who are full of responsibility, teamwork, confidence, speed, accuracy, alertness, and empathy. In addition, integrating local wisdom in learning is quite effective in improving student learning outcomes (Ariyani, 2020; Ramdiah et al., 2020).

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Literature Review

Indonesian education expects to build the character of students in the future. In addition to building student cognitive, character education is essential as the primary foundation instilled in students. Education expects to have cultural morals and morals based on ideological values (Primayana, 2018). Character education is currently essential in the midst of a morality crisis. Local wisdom can become a medium to solve this problem because local wisdom is born from the context of people's lives that can shape character (Kurnianto & Lestarini, 2016; Sembiring et al. 2019). Building student character is not easy. Schools must be able to design a curriculum that integrates local wisdom in learning; of course, this requires the competence of teachers as curriculum developers.

The great potential in local wisdom has not been fully utilized in the field of education. Local wisdom is an ancestral tradition that is believed by the surrounding community so that it can shape the character of the community in the region. The progress of science and technology is so fast that it can slowly erode the existence of local culture. This, of course, will eliminate the nation's culture in the long run. Local wisdom that promotes cultural values needs to reintroduce to students (Tusriyanto, 2020). One example is traditional games/ folk games, which are inherited from ancestors as entertainment, which are not widely played by children (Hidayati, 2020). Many ways can be done to preserve local wisdom. One of them is by integrating local wisdom into a material in school lessons (Hidayati, 2019). Besides, local wisdom can be implemented in learning in the form of books, modules, e-modules, teaching materials, methods and models (Nugraha & Ratnapuri, 2020; Shaleha & Purbani, 2019; Sofyan et al. 2019; Sukma et al. 2019; Toharudin & Kurniawan, 2018; Tusriyanto, 2020). The implementation of local wisdom to shape student character constrain by a lack of learning resources and the negative influence of the globalization era (Priamantono et al. 2020). Local wisdom can shape the character of cooperation, simplicity, religion, politeness, empathy, sincerity, responsibility, friendship, recognition of belonging, and love in a broad sense (Ariyani, 2020; Fuad et al. 2020).

Educators must have the ability to develop learning by integrating local wisdom in it. Forming a student character takes a long time. With local wisdom, little by little characters will be created if introduced every day in learning. Teachers must have the ability to analyze learning needs based on local wisdom, utilize potential and apply them in an effective and strategic learning process (Hunaepi et al. 2019; Salbella & Kumalasari, 2019). This potential can be developed into a learning model, method, or approach. Local wisdom can develop into a learning model. The steps can design in syntax (Hadiyanto et al. 2020; Toharudin & Kurniawan, 2018; Uge et al. 2019). The implementation of local wisdom in learning can be packaged into an educational game and educational comics (Pratama et al. 2018; Murti et al. 2020). The correct implementation of this game based learning not only inform full-scale studies but also enhance the transferability of studies in multiple contexts (Pauline-Graf & Mandel, 2019). Local wisdom can be built with literacy skills in social science (Rokayah & Rochman, 2018). Science learning based on local wisdom fosters a love for local wisdom as part of the nation's culture (Tresnawati et al. 2019). Technological advances can combine with local wisdom, which aims to maintain the existence of both and succeed in increasing people's understanding of the values of local wisdom as character education (Komariah & Asyahida, 2019; Mubarok & Rahmatulloh, 2020).

Game-based learning has a major influence on student achievement at all levels of education, the difference lies in various disciplines of science (Karakoc et al., 2020). The learning process which is packaged by integrating educational games can influence students to learn, different contexts, types of games and learning experiences, so that it is quite effective for students' cognitive and non-cognitive abilities (Chen et al., 2020). Game-based learning is quite adaptive in addressing the learning process by combining cognitive, emotional, social and learning environment characteristics, if it is packaged with the right method, it is effective enough to realize game-based learning in modern education (Griepel et al., 2020). There are many benefits obtained by integrating game-based learning, it can improve the learning process, student motivation and student participation in learning so that they can indirectly increase their knowledge (Troussas et al., 2020). Game-based learning has advantages over conventional-based learning, besides being able to increase student knowledge, [this game-based learning can also increase student self-efficacy (Wang & Zheng, 2020).

The application of local wisdom can explore the critical abilities that must be possessed by students in 21st century learning. Local wisdom can be applied in learning to improve students' critical thinking skills and conceptual mastery of certain materials (Arti & Ikhsan, 2020). Science learning can be packaged with local wisdom because science learning is identical to events in everyday life (Ilhami et al. 2019). Science can develop with character education that is integrated with local wisdom in learning tools (Irwansyah et al. 2020). The learning model developed by integrating local wisdom will encourage a positive climate in the classroom, a learning community, and maximize opportunities to learn (Lyesmaya, 2020). Ethno-pedagogy and local wisdom are seen as quite effective in introducing the noble values of the nation's culture, which can help build a nation's character based on social, culture, and environment (Mukhibat & Effendi, 2020). Based on several literature reviews, this study seeks to develop a collaborative learning method based on local wisdom. Local wisdom in this research is in the form of traditional Sundanese community games, namely *Bebentengan*. To further focus our research, we write down some research questions as follows:

1. How can learning methods based on Sundanese “Bebentengan” folk games improve student learning outcomes?
2. How do students respond to learning methods based on Sundanese “Bebentengan” folk games?

Methodology

Research Design

The method used in this research is a mix-method. Describe each qualitative and qualitative finding. Quantitative data used to measure the improvement of student learning outcomes after treatment. Qualitative data used to describe the results of interviews, questionnaires, and field findings. Quantitative data were obtained from the results of students' tests (pretest and posttest) after the implementation of the learning method was carried out by the teacher. To support the findings, interviews were conducted with several students and questionnaire takers, so that they could be used as a basis for drawing conclusions about the findings in this study.

Sample

This research involved 3 elementary schools (ES), 3 junior high schools (JHS), and 3 senior high schools (SHS). Participants involved in this study were 298 students from various levels of education (ES = 97, JHS = 97, SHS = 104) and as many as nine teachers. Sampling was done by using purposive sampling method, with the reason that the number of students at each level is different. This research was conducted from 2017-2019.

Data Collection

Quantitative data were obtained through written tests, pretest, and posttest on ecosystem material for all levels. The questions are as many as 20 questions. Qualitative data collected by questionnaires, interviews with students and teachers, documentation, and field notes. The method developed is in the form of Sundanese traditional games, namely *Bebentengan*, which is adopted, modified, and integrated into the syntax in the lesson planning. For more details, here is the development of the method together.

The validity of the items using Pearson Product Moment, all items were tested for validity for all levels. The results of the validity test can be seen in Table 1.

Table 1. Results of Test Item Validity for All Levels

	Correlations			
	ES	JHS	SHS	Total Score
ES	1			
JHS	.380*	1		
SHS	.337	.303	1	
Total Score	.766**	.768**	.709**	1

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2. Recapitulation of Question Item Validity

Category	r_{xy}	r_{xy}	Status
ES	0.766	0.3009	Valid
JHS	0.768	0.3009	Valid
SHS	0.709	0.3009	Valid

Based on Table 2, we can see that the items for all levels of education are valid, so they can be used to collect research data. In addition to testing the validity of the items, the reliability of the items was also tested. Test item reliability using Cronbach's alpha. The results can be seen in Table 3.

Table 3. Reliability Test of Question Items

Case Processing Summary			
		N	%
Cases	Valid	29	100.0
	Excluded ^a	0	.0
	Total	29	100.0
Reliability Statistics			
Cronbach's alpha		N of Items	
.607		3	

a. Listwise deletion based on all variables in the procedure.

Based on Table 3, if the Cronbach's alpha value is > 0.60 , the questionnaire or questionnaire is declared reliable or consistent. Meanwhile, if the value of Cronbach's alpha < 0.60 , the questionnaire or questionnaire is declared unreliable or inconsistent. From the table above, it is known that there are 3 items with a Cronbach's alpha value of 0.607. so as the basis for decision making in the reliability test above, it can be concluded that the 3 or all item questions are reliable or consistent.

Furthermore, the validity of the questionnaire was carried out using Pearson Product Moment for all types of education, the results of data recapitulation can be seen in Table 4 (Analysis results can be seen in the appendix).

Table 4. Reliability Test of Question Items

No. Item	r_{xy}	r_{tabel}	Status
1	0.452	0.1663	Valid
2	0.261	0.1663	Valid
3	0.615	0.1663	Valid
4	0.672	0.1663	Valid
5	0.625	0.1663	Valid
6	0.545	0.1663	Valid
7	0.492	0.1663	Valid
8	0.484	0.1663	Valid
9	0.223	0.1663	Valid
10	0.455	0.1663	Valid

Based on Table 4, information is obtained that all questionnaire items are included in the valid status. Furthermore, the reliability test was carried out using Cronbach's alpha which can be seen in Table 5.

Table 5. Reliability Test of Questionnaire Items

Category	Cronbach's alpha	Status
ES	0.752	Valid
JHS	0.665	Valid
SHS	0.712	Valid

Based on the results of the questionnaire reliability test recalpitulation in Table 5, it can be concluded that all questionnaire items at all levels are reliable (Cronbach's alpha $> 0,60$). Some statements in the questionnaire can be seen in the appendix, including some interview questions.

Analyzing of Data

Quantitative data were analyzed using ANCOVA, and statistical tests were carried out to see the differences in the mean learning outcomes of students after treatment. Qualitative data analysis was described based on the results of interviews, questionnaires, and field findings. The qualitative data instrument had previously been validated by experts regarding several questions for interviews and statements for questionnaires.

Research Design

The traditional game of *Bebentengan* is a traditional West Java game that was played by children. This game-play in groups, two large groups with the same number of members. Each group must defend the fortress/castle from attack. The players between groups are chasing each other if anyone is caught in the opponent's prison. Group friends can save friends who go to jail. The game ends when one group has only one person left.

In this study, we modified the *Bebentengan* game to be used as a learning method (Figure 1). modifications are made without eliminating the game entirely, packaged in such a way that this game can be a learning method that can be implemented in the future. Before playing this game, students are given the assignment to study the material to be studied at the next meeting. Each student makes three questions. The questions students make should not be known by other friends. The game will start when everyone is ready with the task. The game is carried out outside the classroom (field). For more details, consider Figure 1.

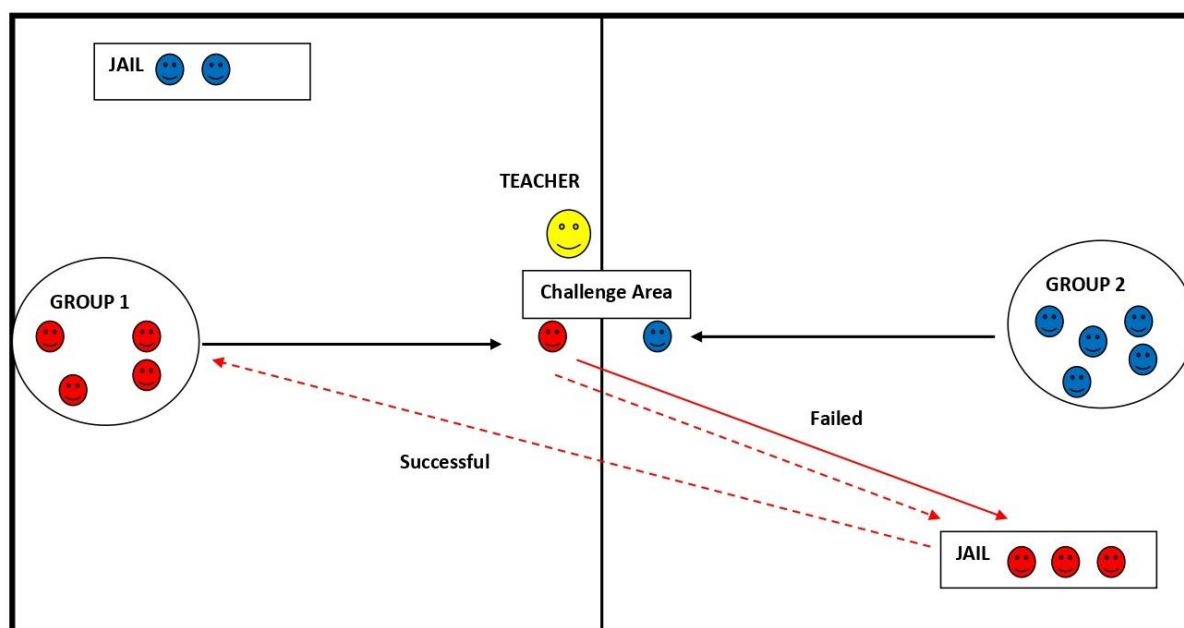


Figure 1. The modified traditional game of Bebentengan

Consider Figure 1. Students are grouped into the same two groups (red and blue). Each group has one leader who organizes its members to come forward. The members who stepped forward faced each other at the centerline in the challenge area. Each student gives a question to the opposing party, and the teacher serves as a judge for each right or wrong answer. For example: if students who are members of the red group cannot answer questions from students in the blue group, then that student will go to prison in the blue group (firm red line). However, if the students in the red group can answer the questions, then the students from the red group can take/save one of their friends who are in prison in the blue group (dashed red line). The game will end if one group leaves only one member

Findings / Results

In this study, a pretest and posttest were conducted to see an increase in student learning outcomes at all levels of ecosystem material. Research data shows an increase in learning outcomes at all levels of education (Figure 2). Furthermore, further analysis is carried out to determine the significance of the improvement in learning outcomes for all levels.

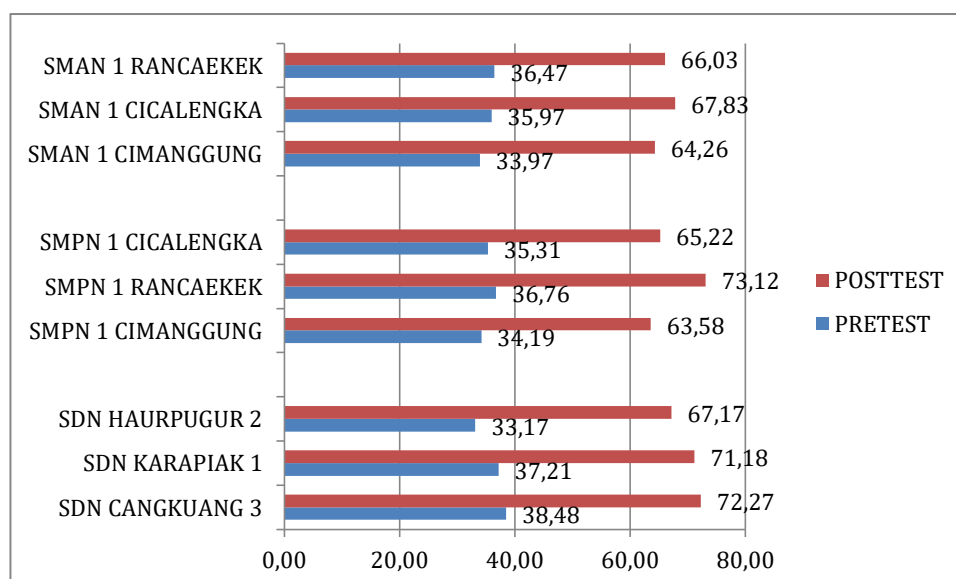


Figure 2. Results of the pretest and posttest for all levels

Based on Figure 2, information is obtained that the posttest results increase at all levels of education, to determine the significance of the increase in pretest and posttest scores, an N-gain analysis is carried out. The N-gain analysis was carried out to see the increase in learning outcomes at all levels of education. this analysis is necessary to conclude. N-gain analysis using t test. The results of the N-Gain analysis are presented in Table 6.

Table 6. Descriptive N-gain of student learning outcomes which uses Sundanese local wisdom-based learning methods

Level	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ES	97	.5307	.12666	.01286	.5052	.5562	.27	.80
JHS	97	.5185	.13775	.01399	.4907	.5462	.07	.79
SHS	104	.4713	.11343	.01112	.4493	.4934	.18	.68
Total	298	.5060	.12826	.00743	.4914	.5206	.07	.80

Table 6. Informs that the higher the level of education, the average n-gain shows a decrease. This, of course, will lead to the question, why did the N-gain value decrease at a higher level? To answer this, researchers conducted interviews with students and teachers, and distributed student questionnaires related to the learning methods implemented. Furthermore, to see the significance of the results of our study, we did the ANCOVA test.

Table 7. ANCOVA test

Tests of Between-Subjects Effects					
Dependent Variable: Post_test					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3076.626 ^a	3	1025.542	10.584	.000
Intercept	32878.383	1	32878.383	339.324	.000
Pre_test	2149.487	1	2149.487	22.184	.000
Level	770.361	2	385.180	3.975	.020
Error	28486.743	294	96.894		
Total	1405710.000	298			
Corrected Total	31563.369	297			

Based on the table above, it can be seen that $\text{sig} = 0.020 < 0.05$. So H_0 is rejected and H_a is accepted: There is a significant difference in the learning of students who get Sundanese local wisdom-based learning methods at each level (ES, JHS and SHS). Then to find out whether the Sundanese local wisdom-based learning method is effective or not, we can see from the following Table 8.

Table 8. Parameter Estimates

Dependent Variable: Post_test						
Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	52.563	3.027	17.364	.000	46.605	58.521
Pre_test	.381	.081	4.710	.000	.222	.540
[Level=1]	3.885	1.391	2.792	.006	1.147	6.624
[Level=2]	1.393	1.389	1.003	.317	-1.341	4.128
[Level=3]	0 ^a

Table 9. Pairwise Comparison between ES, JHS and SHS

Dependent Variable: Post_test							
(I) Level	(J) Level	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b		
					Lower Bound	Upper Bound	
SD	SMP	2.492	1.415	.079	-.294	5.278	
	SMA	3.885*	1.391	.006	1.147	6.624	
SMP	SD	-2.492	1.415	.079	-5.278	.294	
	SMA	1.393	1.389	.317	-1.341	4.128	
SMA	SD	-3.885*	1.391	.006	-6.624	-1.147	
	SMP	-1.393	1.389	.317	-4.128	1.341	

Based on the data above, the comparison between ES and JHS, $\text{Sig} = 0.079 > 0.05$. So it can be concluded that the Sundanese local wisdom-based learning method is not effective to be applied in junior high schools. Then between ES and SHS, $\text{Sig} = 0.006 < 0.05$ so it can be concluded that the Sundanese local wisdom-based learning method is effective

to be applied in elementary schools. The last comparison is between JHS and JHS or vice versa, the value of $\text{Sig} = 0.079 > 0.314 > 0.05$ so that it can be concluded that the Sundanese local wisdom-based learning method is not effective to be applied in SHS. So from the value of sig. In the comparison table it can be concluded that this method is most effective at the primary level. To complement the research data in drawing conclusions, we conducted interviews with a number of students at all levels of education. the results of the interview are presented in Table 10.

Table 10. Interview Results

Educational stage	Conclusion of Interview Results
Primary school	We like learning by the side-by-side method because we can learn while playing This method provides a new experience for us, and we hope learning is done more like this This kind of learning method doesn't bore us Learn to be more enthusiastic
Junior high school	Teachers must use more methods like this so that students are not bored, and learning is not monotonous We are interested in learning methods like this, make us motivated in learning By studying outside the classroom, we feel happier with new experiences Other methods like this must be applied so that we do not always study in the classroom
Senior High School	This method is quite interesting, and it doesn't bore us This method provides new experiences in learning, but we don't have enough time to study too much material The teacher's instructions were poorly understood, so we were confused about what to do Innovative learning methods need to be developed further This method is suitable for elementary school-age children, and we feel this method is not ideal for high school level
Teachers	Get new references for using methods with folk games Provides inspiration to create methods with other games Student involvement in learning is getting better Student motivation increases

Discussion

Designing a learning method is not an easy thing. It is necessary to carry out various deeper analyzes according to the learning needs. In this research, it is necessary to do an in-depth analysis between the learning needs of the digital era and the characteristics of local wisdom that will be used as a learning method. Based on the research results, it shows that the implementation of learning methods based on local wisdom can improve learning outcomes at all levels. Based on the research results, it can be seen that $\text{sig} = 0.020 < 0.05$. So H_0 is rejected and H_a is accepted: There is a significant difference in the learning of students who get Sundanese local wisdom-based learning methods at each level (ES, JHS and SHS). Based on the data above, the comparison between ES and JHS, $\text{Sig} = 0.079 > 0.05$. So it can be concluded that the Sundanese local wisdom-based learning method is not effective to be applied in junior high schools. Then between ES and SHS, $\text{Sig} = 0.006 < 0.05$ so it can be concluded that the Sundanese local wisdom-based learning method is effective to be applied in elementary schools. The last comparison is between JHS and JHS or vice versa, the value of $\text{Sig} = 0.079 > 0.314 > 0.05$ so that it can be concluded that the Sundanese local wisdom-based learning method is not effective to be applied in SHS. In the comparison table it can be concluded that this method is most effective at the primary level.

Based on the findings in this study, the learning method based on local wisdom, in this case, *Bebentengan*, is more suitable to be implemented at the elementary and junior high school levels. We assume that the elementary and junior high school levels are students with an average age of children and children towards adolescents who still prefer traditional games compared to high school students. To strengthen this assumption, we conducted interviews with several elementary, junior high, and high school students. The results of our interviews are summarized in Table 10. Based on the summary of the interview results, we can understand that the *Bebentengan* learning method is not attractive enough for high school students because they are in their teens towards adulthood. Thus it is clear why there is a decrease in N-gain at SHS level; most of them are not interested in this method.

In addition to interviews, we conducted questionnaires to explore student responses in several aspects. Based on the results of the questionnaire data analysis, most students felt triggered to be confident in expressing opinions and building a sense of responsibility towards the group. In line with this, Ariyani (2020) and Fuad et al. (2020) argues that local wisdom can shape student character, build cooperation, simplicity, religion, politeness, empathy, sincerity, responsibility, friendship, recognition of belonging and love in a broad sense. The implementation of learning methods based on local wisdom increases student motivation in learning. Lyesmaya (2020) suggests a learning model developed by integrating local wisdom will encourage a positive climate in the classroom, a learning community, and maximize opportunities to learn so that students will be motivated to learn.

Learning methods based on local wisdom that are developed with educational games are quite effective in improving student learning outcomes, student motivation and student involvement in the learning process at all levels of education. In line with this Karakoc et al. (2020) state that game-based learning has a major influence on student achievement at all levels of education, the difference lies in various disciplines of knowledge. There are many benefits obtained by integrating game-based learning, it can improve the learning process, student motivation and student participation in learning so that they can indirectly increase their knowledge (Troussas et al., 2020). This of course draws attention to how we can develop educational games to support future learning processors. The integration of games in learning must be done in order to reduce the level of student saturation in learning, in line with this Chen et al. (2020) argues that the learning process which is packaged by integrating educational games can influence students to learn, contexts, types of games and different learning experiences, so that it is quite effective for students' cognitive and non-cognitive abilities. Game-based learning is quite adaptive in addressing the learning process by combining cognitive, emotional, social and learning environment characteristics, if it is packaged with the right method, it is effective enough to realize game-based learning in modern education (Griepl et al., 2020)

Students feel that learning is more effective and efficient by using local wisdom-based learning methods. In line with this, Mukhibat & Effendi (2020) explains that ethno-pedagogy and local wisdom are seen as quite effective in introducing the noble values of the nation's culture. It can help build a nation's character based on social, culture, and environment so that it can be packaged in learning. Learning methods based on local wisdom can be packaged in various ways, in the form of integration into learning modules and games. Besides, local wisdom can be implemented in learning in the form of books, modules, e-modules, teaching materials, methods and models (Nugraha & Ratnapuri, 2020; Shaleha & Purbani, 2019; Sofyan et al. 2019; Sukma et al. 2019; Toharudin & Kurniawan, 2018; Tusriyanto, 2020). Likewise, with science learning, science learning can be packaged with local wisdom because science learning is identical to events in everyday life (Ilhami et al. 2019). Science can develop with character education that is integrated with local wisdom in learning tools (Irwansyah et al. 2020). The correct implementation of this game based learning not only inform full-scale studies but also enhance the transferability of studies in multiple contexts (Pauline-Graf & Mandel, 2019). Thus local wisdom-based learning methods need to be developed as an innovative learning method in the digital era. Not demanding the possibility, this method can be combined with technological advances. Example: this *Bebentengan* game is made in the form of a smartphone application, and students can play this game via a smartphone. Thus, in addition to technological elements, we do not forget the aspects of local culture which are increasingly being eroded by the changing times.

Conclusion

Innovative learning methods aim to make the learning process more effective and efficient. Based on the research results, it can conclude that the learning method is based on local wisdom. In this case, the *Bebentengan* game can improve student learning outcomes at all levels. However, based on the results of data analysis, this method is more suitable to be implemented in primary and junior high schools. Based on the results of the interview, students generally showed interest in the *Bebentengan* learning method, which was implemented in the learning process. The result of the questionnaire indicates that students feel typically awakened in themselves an attitude of confidence, cooperation, empathy, and responsibility. This method needs to be developed in the future with a better design.

Recommendations

Based on the findings in this study, the researcher recommends that this learning method be implemented in other schools with a larger research sample. Thus it can be seen that the effectiveness of local wisdom-based learning methods in improving student learning outcomes. This learning method can be integrated in the lesson plan and developed in the school curriculum. Based on the findings in this study, we recommend practitioners that the Sundanese folk game-based (*Bebentengan*) as learning method can be used in the learning process and is effective in improving student learning outcomes.

Limitations

The development of learning methods using local wisdom has weaknesses when applied to different regions in Indonesia. Every region has local wisdom that is different from one another, although there are several types of local wisdom that are the same. The weakness of this learning method can only be applied to areas that have the same or similar folk games / traditional games. In this case the game of *Bebentengan* may only be played by the people of West Java, thus this learning method will be more easily understood by students in West Java.

References

- Adinugraha, F., & Ratnapuri, A. (2020). Modul keanekaragaman hayati dengan pendekatan kearifan lokal dan budaya di kabupaten purworejo [Biodiversity module with local wisdom and culture approach in purworejo regency]. *Composition of Educational Articles/ Susunan Artikel Pendidikan*, 5(1), 26-33. <https://doi.org/10.30998/sap.v5i1.6534>
- Ariyani, F. (2020). Values of character education in Nyirok tradition of Negara Batin customary community and its implications in the local wisdom and ethics education course. *Journal of Progressive Education/ Jurnal Pendidikan Progresif*, 10(1), 38-46. <https://doi.org/10.23960/jpp.v10.i1.202005>
- Arti, Y., & Ikhsan, J. (2020). The profile of junior high school students' critical thinking skills and concept mastery level in local wisdom based on outdoor learning. *Journal of Physic: Conference Series*, 1440, 1-9. <https://doi.org/10.1088/1742-6596/1440/1/012105>
- Chen, C. H., Shih, C. C., & Law, V. (2020). The effects of competition in digital game-based learning (DGBL): A meta-analysis. *Education Tech Research Development*, 68, 1855-1873. <https://doi.org/10.1007/s11423-020-09794-1>
- Fuad, M., Efendi, A., & Muhammad, U. A. (2020). The use of pepacur local wisdom for Indonesian literary teaching materials. *Indonesian Education Journal/ Jurnal Pendidikan Indonesia*, 9(2), 213-223. <https://doi.org/10.23887/jpi-undiksha.v9i2.22779>
- Greipl, S., Moeller, K., & Ninaus, M. (2020). Potential and limits of game-based learning. *International Journal of Technology Enhanced Learning*, 12(4), 363-389. <https://doi.org/10.1504/IJTEL.2020.110047>
- Hadiyanto, A., Samitri, C., & Ulfah, S. M. (2020). Model pembelajaran Bahasa Arab multiliterasi berbasis kearifan lokal di Perguruan Tinggi Negeri [Multiliteracy Arabic learning model based on local wisdom in State Universities]. *HAYULA: Indonesian Journal of Multidisciplinary Islamic Studies*, 4(1), 117-140. <https://doi.org/10.21009/hayula.004.1.07>
- Hidayati, N. N., & Java, E. (2020). Indonesian traditional games: a way to implant character education on children and preserve Indonesian local wisdom. *ISTAWA: Journal of Islamic Education/ ISTAWA: Jurnal Pendidikan Islam*, 5(1), 81-101. <https://doi.org/10.24269/ijpi.v5i1.2475>
- Hidayati, Y. (2019). Analysis of local wisdom toward environmental conservation attitude in Bangkalan district: a preliminary research. *Science Pen Journal/ Jurnal Pena Sains*, 6(1), 51-59. <http://doi.org/10.21107/jps.v6i1.5257>
- Hunaepi, H., Dewi, I. N., & Sumarjan, S. (2019). Profiling students' environmental care attitudes taught using Sasak Tribe local wisdom-integrated model. *Indonesian Journal of Biology Education/ Jurnal Pendidikan Biologi Indonesia*, 5(3), 549-558. <https://doi.org/10.22219/jpbi.v5i3.10009>
- Ilhami, A., Riandi, & Sriyati, S. (2019). Implementation of science learning with local wisdom approach toward environmental literacy. *Journal of Physic: Conference Series*, 1157, 1-6. <https://doi.org/10.1088/1742-6596/1157/2/022030>
- Irwansyah, M., Ferawati, F., Suryani, E., Olahairullah, O., Ariansyah, A., Nurfathurahmah, N., & Rubiati, I. (2020). Developing biology learning tools based on character education integrated with sustainable local wisdom to enhance 21st century attitude of students. *Journal of Physic: Conference Series*, 1521, 8-13. <https://doi.org/10.1088/1742-6596/1521/4/042017>
- Karakoç, B., Eryılmaz, K., Turan Özpolat, E., & Yıldırım, I. (2020). The effect of game-based learning on student achievement: a meta-analysis study. *Technology, Knowledge and Learning*. Advance online publication <https://doi.org/10.1007/s10758-020-09471-5>
- Komariah, S., & Asyahidda, F. N. (2020). Decrease or increase: analysis of the existence of local wisdom as the core of education in the technology Era. *Advances in Social Science, Education and Humanities Research*, 438, 207-210. Atlantis Press. <https://doi.org/10.2991/assehr.k.200513.046>
- Kurnianto, R., & Lestarini, N. (2016, August 30). *Integration of local wisdom in education* [Paper presentation]. International Seminar on Education: Education Trends for Future Society, Muhammadiyah University of Ponorogo, Jawa Timur, Indonesia.
- Lyesmaya, D., Musthafa, B., & Sunendar, D. (2020). Local wisdom value's-based literacy education learning model in elementary. *Journal of Physic: Conference Series*, 1470, 1-7. <https://doi.org/10.1088/1742-6596/1470/1/012030>
- Mubarok, I., & Rahmatulloh, I. N. (2020). Urgensi Penguatan Pendidikan Karakter di SD Melalui Kearifan Lokal Di Era Revolusi Industri 4.0 [The urgency of strengthening character education in elementary schools through local wisdom in the industrial revolution Era 4.0]. In M. T. Multazam (Ed.), *Proceeding of The ICECRS: Educational and Psychological Conference in the 4.0 ERA* (Vol.8, pp. 1-7). Muhammadiyah University.

- Mukhibat, M., & Effendi, M. (2020). Strengthening of national identity through personality development based on ethno-pedagogy at higher education. *International Journal of Psychosocial Rehabilitation*, 24(4), 2548–2559. <https://doi.org/10.37200/IJPR/V24I4/PR201362>
- Murti, D. K., Gunarhadi, & Winarno (2020). Development of educational comic with local wisdom to foster morality of elementary school students: A need analysis. *International Journal of Educational Methodology*, 6(2), 337-343. <https://doi.org/10.12973/ijem.6.2.337>
- Pauline-Graf, D., & Mandel S. E. (2019). Defining preliminary research for digital game-based learning evaluation: Best practices. *International Journal of Educational Methodology*, 5(4), 623-635. <https://doi.org/10.12973/ijem.5.4.623>
- Pratama, Y. A., Buchori, A., & Indriati, T. (2019). Development of education game based on local wisdom religion lessons in paud in Semarang city. *Advances in Social Science, Education and Humanities Research*, 287, 282-285. <https://doi.org/10.2991/icesre-18.2019.62>
- Priamantono, R. S., Wardo, & Musaddad, A. A. (2020). Implementation of local wisdom values of *piil pesenggiri* as character education in Indonesian history learning. *VNU Journal of Science: Education Research*, 36(4), 1–10. <https://doi.org/10.25073/2588-1159/vnuer.4366>
- Primayana, K. H. (2018). The implementation of school management based on the values of local wisdom tri hita karana and spiritual intelligence on teacher organizational commitments. In *Proceeding International Seminar (ICHECY 2018)* (pp. 154-159). STAHN Mpu Kuturan Singaraja.
- Ramdiah, S., Abidinsyah, A., Royani, M., Husamah, H., & Fauzi, A. (2020). South Kalimantan local wisdom-based biology learning model. *European Journal of Educational Research*, 9(2), 639-653. <https://doi.org/10.12973/eu-jer.9.2.639>
- Rokayah, R., & Rochman, C. (2019). Local wisdom based on the social science literacy in elementary education. *Advances in Social Science, Education and Humanities Research*, 253, 149–151. <https://doi.org/10.2991/aes-18.2019.35>
- Salbella, M. W., & Kumalasari, D. (2020). History learning based on local wisdom of Taluba. *Advances in Social Science, Education and Humanities Research*, 398, 107–109. <https://doi.org/10.2991/assehr.k.200130.023>
- Saragih, L. J., Somantri, L., & Yani, A. (2013). The value of local wisdom managing natural resources in lake Toba as a source of learning geography. *The 2nd International Conference on Elementary Education*, 2(1), 744-751. Universitas Pendidikan Indonesia.
- Sembiring, A. S., Widiastuti, U., Tobing, O., Siburian, E. P. T., Sembiring, H. O., & Sembiring, E. J. (2019). Character formation based on North Sumatra local wisdom through orchestral learning in music education study program, Universitas Negeri Medan. *Budapest International Research and Critics Institute-Journal*, 2(4), 315-325. <https://doi.org/10.33258/birci.v2i3.300>
- Shaleha, M. A., & Purbani, W. (2019). Using Indonesian local wisdom as language teaching material to build students' character in globalization era. In M. Mostafa & D. Thapa (Eds.), *ISOLEC 2019 Conference: International Seminar on Language, Education, and Culture* (pp.292–298). KnE Social Sciences. <https://doi.org/10.18502/kss.v3i10.3910>
- Sofyan, H., Anggereini, E., & Saadiah, J. (2019). Development of e-modules based on local wisdom in central learning model at kindergartens in Jambi city. *European Journal of Educational Research*, 8(4), 1137-1143. <http://doi.org/10.12973/eu-jer.8.4.1137>
- Sukma, T. A., Mundilarto, & Putri, N. D. (2019). Local wisdom-based elektronik book on Newton's law. *Al-BiRuNi Scientific Journal of Physics Education/ Jurnal Ilmiah Pendidikan Fisika Al-BiRuNi*, 8(2), 197-206. <https://doi.org/10.24042/jipfalbiruni.v0i0.4368>
- Toharudin, U., & Kurniawan, I. S. (2019). Learning models based Sundanese local wisdom : Is it effective to improve student's learning outcomes? *Journal of Physic: Conference Series*, 1157, 1-6. <https://doi.org/10.1088/1742-6596/1157/2/022069>
- Tresnawati, N., Saleh, I., Kurniawan, D. T., Sudirman, & Wardani, S. (2020). Learning science through steam approach (Science technology , engineering , arts , and mathematics) integrated ethnoscience in the context of batik culture for pre service teachers of primary education. In Z. Karssen, R. de Boer & R. Dang (Eds.), *Proceeding of The International Conference on Agriculture, Social Sciences, Education, Technology and Health: Advances in Social Science, Education and Humanities Research* (pp.243–246). Atlantis Press, Amsterdam.
- Troussas, C., Krouska, A., & Sgouropoulou, C. (2020). Collaboration and fuzzy-modeled personalization for mobile gamebased learning in higher education. *Computers & Education*, 144, 1-18. <https://doi.org/10.1016/j.compedu.2019.103698>
- Tusriyanto. (2020). Pengembangan model pembelajaran terpadu berbasis budaya lokal di SD kota Metro [Development of integrated learning model based on local culture in elementary School kota Metro]. *Elementary*, 6(1), 59-72.

- Uge, S., Neolaka, A., & Yasin, M. (2019). Development of social studies learning model based on local wisdom in improving students' knowledge and social attitude. *International Journal of Instruction*, 12(3), 375-388. <https://doi.org/10.29333/iji.2019.12323a>
- Wang, M., & Zheng, X. (2020). Using game-based learning to support learning science: a study with middle school students. *Asia-Pacific Education Researcher*. Advance Online Publication. <https://doi.org/10.1007/s40299-020-00523-z>

Appendix*Questionnaire*

No	Statement	Score			
		1	2	3	4
1	<i>Bebentengan</i> Game builds confidence in learning				
2	<i>Bebentengan</i> games increase enthusiasm for learning				
3	Get new experiences from <i>Bebentengan</i> games that are integrated into learning				
4	<i>Bebentengan</i> games build a sense of self-empathy in learning				
5	<i>Bebentengan</i> games build a sense of self-responsibility in learning				
6	<i>Bebentengan</i> Games enhance teamwork in learning				
7	The integration of <i>Bebentengan</i> games provides new motivation for learning				
8	Learn more effectively and efficiently				
9	Game <i>Bebentengan</i> suitable methods for the learning process				
10	<i>Bebentengan</i> games preserve the local culture that is packaged in learning methods				