



Application of the Traditional Snakes and Ladders Game as an Indonesian Language Learning Media to Train Students' Language Skills in Elementary Schools

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Abstract: In learning Indonesian, there are four good language skills that every student must have. Good language skills are one of the most important things in everyday life, so students should not only be taught about the theory conveyed through teacher explanations, it can make the learning atmosphere boring and the learning atmosphere less active, but they should also Teachers can make learning and learning models more effective so that they master, understand and can help train their language skills. Researchers here use literature study methods which require a deep thought process and insight. Namely by collecting data specifically through gathering information from books, trusted written sources related to the topic being researched, journals, and scientific publications. The data source used was obtained indirectly. One example of innovation that can help Indonesian education is using simple learning media based on Snakes and Ladders. The Snakes and Ladders learning media is a learning media that is neatly arranged and in its use it uses the Snakes and Ladders game pattern in general, making it easy for students to adapt to this learning media. Making Snakes and Ladders learning media can be an alternative in the learning process so that it can create a teaching and learning atmosphere that is more varied, more enthusiastic, and more active. One of the learning media is Snakes and Ladders, which can be used in the teaching and learning process to train students' abilities in their language skills in Indonesian language lessons. This game can be a forum or place that students can use to play and learn.

Keywords: Character Education; Learning Media; Traditional Games

Introduction

Effective learning, according to (Sutikno, 2007), is learning that allows students to learn learning objectives that are simple, fun, and can be carried out according to expectations. Apart from that, good and effective learning is a teaching and learning process that can produce high-quality learning, which places great emphasis on participation and respect for students (Suwarno, 2006). The learning process can be said to be good if the learning process is meaningful. The learning process is said to be meaningful if the material that has

been studied will be continuously remembered and stored in memory, thus allowing new knowledge to emerge and ultimately be implemented in everyday life. Good language skills are one of the most important things to have in every lesson in everyday life.

Language skills are something that every human needs. This is because language skills are a model for developing students' intellectual, character, and social abilities (Magdalena et al., 2021). In learning Indonesian there are four aspects of language skills, including listening skills, speaking skills, reading skills, and writing skills (Pamuji & Inung, 2021). These four good

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language skills are considered very important in everyday life. These four language skills are things that must be trained for students. The more often students are trained, the more fluent and better they will be in terms of writing, reading, listening, or speaking language skills. Therefore, students are required to have good language skills, therefore students can improve their language skills in Indonesian language subjects.

In this case, it is still common to find students who have low language skills, whether in terms of listening, speaking, reading, or writing. This happens because there are factors that can hinder the teaching and learning process. For example, students have delays in understanding the material, low motivation to learn, as well as laziness in learning, and students' lack of enthusiasm in studying Indonesian language subjects, these are examples that originate from internal factors or factors that originate from the students themselves. Apart from that, there are external factors or factors that come from outside the student, such as a lack of parental attention in the student's learning development and so on. Therefore, as educators, you need to direct and build a learning environment with a comfortable and enjoyable atmosphere (Yusrin et al., 2023).

For this reason, in the learning process, students should not only be taught about theories conveyed through teacher explanations, which can make the teaching and learning atmosphere boring and can help the learning process become less active, but teachers should also be able to make learning and the learning models used more effective. so that they master, understand, and can apply these language skills.

The importance of students in language learning means that new innovations need to be built in the teaching and learning process. In education in Indonesia, it is still often found that the learning process lacks new touches, so learning looks monotonous, making students feel bored and bored because they only listen to explanations from the teacher. Adding new innovations to be able to achieve a good teaching and learning process. An example is using learning media in the teaching and learning process which can attract the interest and attention of students.

Media is a tool or intermediary used by humans to disseminate or convey thoughts, ideas, and opinions, so that the information that has been obtained reaches the intended recipient (Arsyad, 2002). Learning media is one of the most important things to improve the quality of education in the teaching and learning process, because teachers will convey material or information to students in a more meaningful way.

The benefits of using learning media are that it can be a tool for teachers to achieve learning goals so that teachers can explain learning materials easily and systematically, students have learning motivation so

they can understand learning materials easily, and help improve the quality of learning. by delivering interesting material (Nurrita, 2018). Meanwhile, the benefits of using learning media according to (Rohani, 2019), are so that students do not feel bored and the learning process is not monotonous. This also aims to make students active in learning.

The use of learning media can be created if an educator has creativity in creating learning media. As an educator, before determining learning media, you must first adjust it to Basic Competencies and Learning Indicators and so on. In particular, educators must have skills in creating and using learning media, so that in the learning process educators can easily convey material using this learning media. In the learning process, there are many examples of learning media that can be used. Learning media based on the traditional game Snakes and Ladders can be an example of learning media that can help improve learning to be relevant and meaningful.

Snakes and Ladders are known in everyday life as a game, but without realizing it, the Snakes and Ladders game can also be used as a learning medium to help the learning process take place. This Snakes and Ladders-based learning media can be used in the Indonesian Language and Literature learning process to help students' language skills.

Based on the explanation outlined above, the problem formulation of this research is that researchers are interested in researching the application of the traditional game Snakes and Ladders as a medium for learning Indonesian to train students' language skills.

Method

The method used in this research is a qualitative descriptive method. According to (Sumanto, 1990), the qualitative descriptive approach is essentially research with the aim of explaining and analyzing conditions or relationships that already exist, opinions that are being formed, results that are occurring, processes that are ongoing, and tendencies that are being formed. According to (Moleong, 2005), a qualitative descriptive approach is a research approach that collects data in the form of images, words and does not include numbers. This data can be collected through field notes, interviews, video recordings, images, personal information, and other documents.

The appropriate method for implementing Snakes and Ladders learning media in Indonesian language learning to train students' language skills is to use a qualitative descriptive method. The researcher's aim in conducting this research is to find out how to implement the Snakes and Ladders game as an Indonesian language learning medium to train students' language skills. In

this way, educators are able to apply new innovations in learning in the form of learning media based on the Snakes and Ladders game, and through this can create good and effective learning.

In looking for answers about using the Snakes and Ladders game as a learning medium. Researchers here use literature study methods which require a deep thought process and insight. Namely by collecting data specifically through gathering information from books, trusted written sources related to the topic being researched, journals, and scientific publications. The data source used was obtained indirectly.

The steps are: 1) Search for and collect information or data from books, papers, journals, and other written sources. 2) Organize data by selecting key components and summarizing and describing them concisely. 3) Presented in written form to make it easier to understand. 4) Make conclusions based on the meaning that has been presented. 5) Write the results in article form.

Result and Discussion

Playing as a Learning Medium

To achieve good language skills as an educator, you can create an innovative learning atmosphere. As an educator, you need to make efforts to create good learning media. One way is by creating and building creative and fun learning media (Mar'atusholihah et al., 2019).

Use of media in the learning process to attract students' attention, clarify the delivery of material, overcome time, space, and cost constraints, prevent misinterpretations, and activate students' ongoing teaching and learning activities. Therefore, educators can choose learning media that are able to directly involve students in using the media, such as using traditional games to be used as learning media or a place to practice students' language skills.

According to the Big Indonesian Dictionary (KBBI), a game comes from the word main, which means actions or activities that are not carried out seriously or are just playing around. The game is a competition between players who interact with each other and all players must obey the rules to achieve certain goals (Sadiman, 2010: Muhammad et al., 2018). A game is something that is used for playing and is made from items or something that generally aims to entertain and be a pleasure for everyone who plays it.

Based on (Tedjasaputra's, 2007), opinion a game is the process of carrying out an activity that is controlled by certain rules. Meanwhile, according to Ruswandi, a game is an activity that can provide a learning experience for each participant or person who will play it (Farhurohman, 2017). Playing has benefits and

functions for children, namely by playing children can train their personal skills, both in terms of physical skills and creativity. Apart from that, it can also help develop developmental aspects in children (Hayati & Putro, 2021).

The play approach is a teaching and learning process carried out in the form of play. In this case, students are given the freedom to express their abilities in order to achieve learning goals. Apart from that, according to (Chabib et al., 2017), teaching and learning activities while playing are also able to make students think more critically because apart from playing, students are expected to be able to get as much information as possible. For this reason, teachers have an important task in building interesting and meaningful learning for students.

Carrying out the teaching and learning process in the form of a game can also foster a sense of enthusiasm in students during the learning process. In general, the form of game that is often used can present challenging problems so that later these problems can be resolved by the player. Using snake game media is one of the innovative learning media that is creative and interesting so that it can attract students' attention and can increase students' enthusiasm for learning and is able to improve students' learning outcomes (Fitriana, 2018).

Definition of Snakes and Ladders Game

According to (Melsi, 2015: 10), The game of Snakes and Ladders is a game usually played by children that uses a game board and can be played by two or more people. The game board will be divided into small squares and some of these squares will have a "ladder" or "snake" drawn on them. Meanwhile, according to (Wati, 2021), the media game Snakes and Ladders is a traditional game that was developed based on the characteristics of students, so that it can be a forum or place to complete material for students. According to (Lestari, 2021), said that each player in the Snakes and Ladders game will have a turn to throw the dice in the agreed order. The dice contain the numbers 1-6, and inside the snake and ladder board, there are small boxes containing pictures of Snakes and Ladders. After throwing the dice, each player is allowed to play the game by taking steps according to the numbers that appear (Hasan & Putra, 2021).

Using the snake and ladder game media can encourage students to be more creative and focused when studying, able to improve student learning outcomes. The application of this media can encourage students to have a high enthusiasm for learning so that they can achieve learning goals and improve good learning outcomes. Apart from that, using learning

media based on the Snakes and Ladders game can train students to improve their language skills in learning.

Application of the Traditional Game Snakes and Ladders in the Learning Process

The beginning of learning will start with apperception, then delivery of the material, and after that it will proceed to the game session. In this case, the teacher will not deliver the material continuously but the educator will invite students to play Snakes and Ladders. The game that will be played has a lot of value contained in it, such as students will answer questions that can increase their knowledge. The next activity is the Snakes and Ladders game, this activity will be carried out in groups. During the game, students will be invited to explore material that has been previously studied and students will answer questions that have been prepared by the teacher. Through these activities, students will be able to train their language skills. Paying attention to every activity that takes place is included in listening skills. Reading and answering questions confidently is included in reading and speaking skills. The last activity is the closing activity.

The aim of using Snakes and Ladders media is to find out how well you have achieved understanding of the material that has been presented. The objectives are: 1) Apperception Session: At the beginning of learning the teacher can open learning activities in a calm and cheerful atmosphere and the teacher can provide apperception or questions that can stimulate students' enthusiasm for learning. The teacher's goal in creating a calm classroom atmosphere is to create focus in students when they play the Snakes and Ladders game. 2) Material Delivery Session: At this stage, the teacher will present the learning material that will be discussed at the meeting. Apart from that, after the teacher explains the material, one of the most important things to do is that the teacher is required to describe the flow of the learning media game that students will use later, starting from the game steps to the game rules that have been applied. The goal is for students to understand what they will do when using the learning media. In this session, the teacher also provides opportunities for every student who does not understand the material that has been explained, because the understanding that these students have will influence their level of success in answering the questions in the game. 3) Game Session: In this activity session, the teacher and students will start activities to start using the snake and ladder game media. Every player who participates in the game must comply with every step and rule in the game that has been previously established.

According to (Rahayu et al., 2019), Steps in implementing the Snakes and Ladders game as a learning medium: 1) The teacher starts the activity by

paying attention to the game, starting by explaining the procedures and rules for playing. 2) The teacher divides the class into 4 groups. 3) Each group receives one piece consisting of a color. 4) To start the game, players will do a "hompimpa" whose purpose is to determine the order of play. 5) The order of players will be adjusted to the "hompimpa" winner. 6) This game begins by being played by the first player moving his pieces according to the dice numbers that appear. 7) Players are allowed to roll the dice again if the number 6 appears on the dice, but with the condition that the player must be able to answer the questions given. 8) Each player who plays will occupy a box. 9) If the player occupies a box with a picture of a snake, the player is required to go down to the end of the long picture of the snake, but conversely, if the player occupies a box with a picture of a ladder, the player will be given the opportunity to continue his steps to the end of the picture of the ladder and the player does not need to answer the question. 10) The first player to occupy the box must return to the star box or starting position if there are players in the same box. 11) If a group reaches the finish line, then that group becomes the winner and the game will be stopped.

Not far from the opinion above. Here, in using the Snakes and Ladders game as a language learning medium, there are rules for playing the Snakes and Ladders game in general, only here, apart from playing, students will answer the questions contained in the envelopes provided. There are ways to play the Indonesian language game Snakes and Ladders to train students' language skills. These methods are: a) Each participant will randomize the dice, according to a predetermined sequence agreement. b) If the dice number appears, then the participant will play their piece according to the dice number that appears. c) Next, if the participant occupies a place where there is a puzzle question, then the participant is required to answer the questions on the envelope containing the questions. The envelopes that will be taken are adjusted to the number of digits occupied by the participant. d) If the answer is correct, the participant is given the opportunity to roll the dice number again according to the dice number that appears, then the participant can carry out the steps again according to the location. e) If the answer is wrong, then the participant will stay in that place and will not be given the opportunity to roll the dice number. f) If the position occupied has a picture of a snake's tail, participants are required to descend according to the length of the snake's body and participants will also be asked to answer the questions in the envelope containing the questions in that place. g) And conversely, if the position occupied contains a picture of a ladder, then participants are required to climb the steps according to the length of the ladder picture. h) If the participant has reached the finish line and is able to

answer the questions given, then the participant is declared to have passed.

In general, the Snakes and Ladders game is a game that is often played by children in everyday life. Apart from that, this game can be used as a learning medium for various subjects and apart from that, this media can be played at all grade levels. Using the Snakes and Ladders game as a language learning medium is to give students motivation to learn or review previously taught material and later be tested using game media, thus making learning fun for them. Apart from that, it can indirectly help students with their language skills.

Advantages and Disadvantages of the Snakes and Ladders Game

Basically, each media has its advantages and disadvantages, this is also the case with Snakes and Ladders learning media. According to (Satrianawati, 2018:72), the advantages of the Snakes and Ladders game media are: a) One of the thematic learning media. b) Can be a place for students to learn and play, so that it can attract students' interest in learning. c) In implementing it, students can participate directly. d) Can help children's development in all aspects, one of which is language skills. f) Able to stimulate and help students learn to solve problems. g) Can be used in the classroom and outside the classroom.

The advantage of the Snakes and Ladders game media is that it is able to motivate students to compete seriously in winning the game, and helps students concentrate in answering the questions given, thus creating a good sense of competition during the game, and can increase participants' enthusiasm for learning. education (Rahayu et al., 2019).

Based on the explanation above, it can be concluded that the Snakes and Ladders learning media is a fun medium for children, students can participate directly in using it, and it can attract students' attention. This media can also stimulate students in learning to solve simple problems, and this Snakes and Ladders-based learning media can also be used in various subjects and carried out outside the classroom and inside the classroom.

Apart from that, there are also shortcomings of this snake and ladder media. The snake and ladder game media will cause difficulties for educators due to the uncondusive atmosphere that occurs due to the strong interaction between students (Said & Andi, 2015: 240).

According to (Satrianawati, 2018:73), there are shortcomings in the Snakes and Ladders game media. namely: a) The game is not finished on time, for fear that students or players will fall when they meet the snake's tail. b) It takes a lot of time to explain the use of the Snakes and Ladders game to students. c) All learning materials cannot be developed using the Snakes and Ladders game. d) Students' understanding is lacking

regarding the rules of the game, which will cause confusion. e) For students who do not understand and master the learning material, it will be difficult to play.

Conclusion

Teaching and learning activities interspersed with play can attract the attention of educators because they can provide good results to improve the ongoing learning atmosphere. Implementing learning while playing activities can also make the ongoing learning process innovative learning compared to the previous learning process. The use of traditional games as a learning medium is very helpful in improving a good learning atmosphere. These games are games that can create an active, creative learning atmosphere, encourage students' enthusiasm in learning, and can create a fun learning atmosphere for students.

The game is said to be successful if in its implementation it can create a serious, relaxed atmosphere, and can turn a bored atmosphere into a cheerful and enthusiastic one. The game is a competition between players who interact with each other, and follow certain rules and steps, so that it can create an active learning atmosphere, a bored atmosphere becomes cheerful and enthusiastic for everyone who has played the game. An example of a game that can be used as a learning medium is the traditional game of Snakes and Ladders. Using the Snakes and Ladders game as a learning medium has the same rules and steps as playing Snakes and Ladders in general, only using the Snakes and Ladders game in teacher learning will add to the puzzle questions that will be answered by each participant later. The Snakes and Ladders game media can be played outside the classroom or inside the classroom, this is an advantage in using this media. Meanwhile, the disadvantage of this Snakes and Ladders game media is that it takes a lot of time to complete the game.

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References

- Arsyad, A. (2002). *Media Pembelajaran*. Jakarta: Rajawali Pers.
- Chabib, M., Djatmika, E. T., & Kuswandi, D. (2017). Efektivitas pengembangan media permainan ular

- tangga sebagai sarana belajar tematik SD. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 2(7), 910-918. Retrieved from <http://journal.um.ac.id/index.php/jptpp/article/view/9634>
- Farhurohman, O. (2017). Hakikat Bermain dan Permainan Anak Usia Dini di Pendidikan Anak Usia Dini (PAUD). *As-Sibyan: Jurnal Pendidikan Anak Usia Dini*, 2(01), 27-36. Retrieved from <https://www.scribd.com/document/538456691/1334-145-3340-1-10-20190128>
- Fitriana, N. F. (2018). *Pengembangan Media Permainan Ular Tangga Terintegrasi Asmaul Husna Pada Pembelajaran Tematik*. Universitas Islam Negeri Raden Intan Lampung, Indonesia.
- Hasan, A., & Putra, P. (2021). Peningkatan Hasil Belajar Siswa Menggunakan Media Permainan Ular Tangga pada Mata Pelajaran IPS di Kelas IV Sekolah Dasar Negeri 02 Lengkenat. *Karangan: Jurnal Bidang Kependidikan, Pembelajaran, dan Pengembangan*, 3(1), 15-20. Retrieved from <https://ejournal.billfath.ac.id/index.php/karangan/article/view/83/86>
- Hayati, S. N., & Putro, K. Z. (2021). Bermain dan permainan anak usia dini. *Generasi Emas: Jurnal Pendidikan Islam Anak Usia Dini*, 4(1), 52-64. Retrieved from <https://journal.uir.ac.id/index.php/generasiemas/article/download/6985/3381>
- KBBI (Kamus Besar Bahasa Indonesia). Diakses pada 5 July 2023. Retrieved from <https://kbbi.lektur.id/permainan>
- Lestari, I. C. (2021). Penerapan Media Permainan Ular Tangga terhadap Peningkatan Hasil Belajar Mata Pelajaran IPS di Sekolah Dasar. *Mahaguru: Jurnal Pendidikan Guru Sekolah Dasar*, 2(1), 79-87. Retrieved from <https://ummaspul.ejournal.id/MGR/article/download/1730/570/>
- Magdalena, I., Ulfi, N., & Awaliah, S. (2021). Analisis pentingnya keterampilan berbahasa pada siswa kelas IV di SDN Gondrong 2. *EDISI: Jurnal Edukasi dan Sains*, 3(2), 243-252. Retrieved from <https://ejournal.stitpn.ac.id/index.php/edisi/article/view/1336>
- Mar'atusholihah, H., Priyanto, W., & Damayani, A. T. (2019). Pengembangan media pembelajaran tematik ular tangga berbagai pekerjaan. *Mimbar PGSD Undiksha*, 7(3), 253-260. Retrieved from <https://ejournal.undiksha.ac.id/index.php/JJPGSD/article/view/19411>
- Melsi, R. (2015). *Permainan Interaktif dalam Pembelajaran*. Jakarta. Grasindo
- Moleong, L. (2005). *Metodologi Penelitian Kualitatif*. Bandung: PT Remaja Rosdakarya.
- Muhammad, D., Wardhono, W. S., & Afirianto, A. (2018). Analisis Penerapan Markerless Augmented Reality pada Video Game Memancing dengan Pendekatan Simultaneous Localization and Mapping (SLAM). *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, 2(12), 7083-7087. Retrieved from <https://text-id.123dok.com/document/yrk4v7oz-analisis-penerapan-markerless-augmented-reality-pada-video-game-memancing-dengan-pendekatan-simultaneous-localization-and-mapping-slam.html>
- Nurrita, T. (2018). Pengembangan Media Pembelajaran Untuk Meningkatkan Hasil Belajar Siswa. *Jurnal Misykat*, 3(1), 171-187. Retrieved from <https://www.neliti.com/id/publications/271164/pengembangan-media-pembelajaran-untuk-meningkatkan-hasil-belajar-siswa>
- Pamuji, S. S., & Inung Setyami, S. S. (2021). *Keterampilan Berbahasa*. Jakarta: Guepedia.
- Rahayu, E., Rusmin, A. R., & Deskoni, D. (2019). Pengaruh media permainan ular tangga terhadap hasil belajar peserta didik kelas XI pada mata pelajaran ekonomi di SMA Negeri 10 Palembang. *Jurnal PROFIT: Kajian Pendidikan Ekonomi dan Ilmu Ekonomi*, 6(2), 155-166. Retrieved from <https://ejournal.unsri.ac.id/index.php/jp>
- Rohani. (2019). *Media Pembelajaran*. Buku Diktat. Sumatra Utara: Fakultas Ilmu Tarbiyah Dan Keguruan Universitas Islam Negeri Sumatera Utara.
- Sadiman, A., (2010). *Media Pendidikan: Pengertian, Pengembangan dan Pemanfaatannya*. Jakarta: Rajawali Pers.
- Said, A., & Andi, B. (2015). *95 Strategi Mengajar Multiple Intelligences Mengajar Sesuai Kerja Otak dan Gaya Belajar Siswa*. Jakarta: Prenada media Group.
- Satrianawati. (2018). *Media dan Sumber Belajar*. Yogyakarta: Budi Utama.
- Sumanto. (1990). *Metodologi penelitian Sosial dan Pendidikan*. Yogyakarta: Andi Offset.
- Sutikno, M. S. (2007). *Menggagas Pembelajaran Efektif dan Bermakna*. Mataram: NTP Press.
- Suwarno, W. (2006). *Dasar-Dasar Ilmu Pendidikan*. Yogyakarta: Ar- Ruzz Media.
- Tedjasaputra, M.S. 2007 *Bermain Mainan Dan Permainan*. Jakarta: PT. Grasindo, 2007.
- Wati, A. (2021). Pengembangan Media Permainan Ular Tangga untuk Meningkatkan Hasil Belajar Siswa Sekolah Dasar. *Mahaguru: Jurnal Pendidikan Guru Sekolah Dasar*, 2(1), 68-73. Retrieved from https://r.search.yahoo.com/_ylt=AwrKDa4lreFILCYFFh7LQwx.;_ylu=Y29sbwNzZzMEcG9zAzIEednRpZAMEc2VjA3Ny/RV=2/RE=1709317541/RO=10/RU=https%3a%2f%2fummaspul.e-

journal.id%2fMGR%2farticle%2fdownload%2f1728%2f568%2f/RK=2/RS=ersd7fRnmPCDo8kP9Db
yMC.Ifgc-

Yusrin, Karma, I. N., & Hakim, M. (2023). Analisis Kesulitan Belajar Bahasa Indonesia Peserta Didik Kelas IVA SDN 32 Cakranegara. *Journal of Classroom Action Research*, 5(2), 1-11. Retrieved from <https://jppipa.unram.ac.id/index.php/jcar/article/view/2820/2091>