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by Nunung Mulyani

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Research Article

LITERATURE REVIEW THE USE OF ANDROID-BASED GAMES AS LEARNING MEDIA

[1,*]Etin Rohmatin, [2]Nunung Mulyani and [3]Dewi Nur Hidayah

[1]Midwifery Department of Health Polytechnic Republic of Indonesia's Health Ministry Tasikmalaya, Indonesia
[2]Midwifery Department Of Health Polytechnic Republic Of Indonesia's
[3]Health Ministry Tasikmalaya, Tasikmalaya, Indonesia

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Abstract

Smartphones are increasingly sophisticated with various features, such as games, one of the most popular forms of entertainment. Some games are designed to teach students development concepts as well as guide and motivate them to understand practical skills.a literature review research with data from national and international journals related to Android-based games as learning media and descriptively analyzed. This study has retrieved 20 relevant literatureabout leraning media from different jounal and comference available in the databased of google Scholar, science direct and other.The use of Android-based games as learning media contains text, images, audio, and graphics with an interesting storyline. Therefore, by using interactive games media, children's abilities and understanding will be better and capable of improving their learning outcomes more effectively. The learning media created will display a more effective and interactive learning process using computer technology compared to previous media. The results showed that the interactive games media increases student abilities and understanding, hence, it can be effectively applied.

Keywords: Android, Games, Learning media, Smartphones.

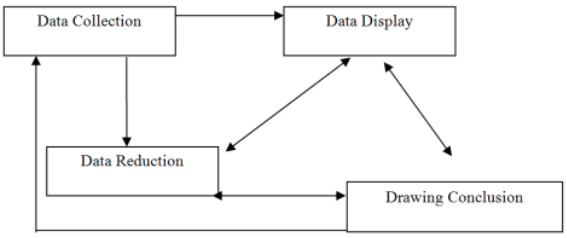
INTRODUCTION

The ever-increasing sophisticated technology is effectively utilized to simplify human life in various ways, such asthe educational game media[1].Game is one of the most popular means of entertainment, which development has increased over the years. This media is used to relax, refresh, and play with friends during leisure. It can be conducted online or offline on various platforms, including mobile phones, desktops, websites, etc[2]. Educational game is designed to teach, guide, and motivate students regarding a particular lesson for proper understanding. This media fosters student interest in learning material, hence,they easily understand the subject matter conveyed by teachers and improve their critical thinking skills. The educational game evaluated in this researchis Android-based, which can be easily accessed anywhere and anytime[3]. Currently, smartphones are used for various activities, such as games, with the most popular design using the android operating system. Based on the field tests, the educational media in Indonesia is still conventional and carried out through the lecture approach. The extension activities showed that using technology and digital media to teach students by combining bright color compositions and unique fonts has not been optimized. Consequently, there is a need to develop a media that can answer the challenges of technological development conceptualized in a more attractive, fantasy, and interactive way[4].Based on the explanation, this research contains a literature review on the development of Android-based educational media.

MATERIALS AND METHODS

This isa literature review researchwith data from national and international journals related to Android-basedgames as learning media and descriptively analyzed. The result showed the events, cases, phenomena, variables, and circumstances during the research process. This study has retrieved 20 relevant literatur eabout leraning media from different jounal and comference available in the databased of google Scholar, science direct and other.

According toMilesand Huberman, the stages of dataanalysis in qualitative research are as follows[5]:



Corresponding Author:** *Etin Rohmatin
Midwifery Department of Health Polytechnic Republic of Indonesia's Health Ministry Tasikmalaya, Indonesia

Qualitative data analysis includes four stages, namely:

a. Data collection is gathering field data by reviewing journals and conducting experiments to obtain the information needed for the research objectives.
b. Data reduction issummarizing, selecting, and focusing on important aspects of data to obtain a clear description, needed to retrieve the next data.
c. Data display is the presentation of data in qualitative research, usually in the form of short descriptions, charts, relationships between subjects, etc.
d. Conclusion and verification are comprising new findings.

RESULTS AND DISCUSSION

Table 1 shows an overview of several national and international research journals related to the use of Android-based games as learning media:

Table 1. Journal Analysis

No	Source/Journal	Journal Analysis
1	Procedia Comput Sci. 2015; 59: 392 - 399. doi:10.1016/j.procs.2015.07. 549.	Title: Game Development “Tales of Mamochi” A Playing Game Concept Based on Android Author: Agnes Kurniatia, Nadiaa, Fidelson Tanzila, and Fredy Purnomo Result: "Tales of Mamochi" is an RPG genre game played offline on Android-based smartphones. It consists of two main characters, namely a Craftsman and a Wizard known as Einhart and Claudyne, respectively. The goal is to complete the quest by saving the princess. This game has an attractive interfacewith interactive 2D graphics. It also meets the criteria of the eight golden rules and the five measured human factors. Conclusion: Most players feel they can practice resource management by playing this game. Developing the main feature of RPG, namely Battle (PVE), with partners such as Mamochi, can make the game more interesting.
2	Spirit Pro Patria. 2019; 5(1): 1-10 E-ISSN: 2443-1532.	Title: Game Learning Fisika “Asah Otak” Berbasis Android Dengan App Inventor2 (Android-Based"Brain Teaser" Physics Learning Games with App Inventor 2) Author: Rizky Parlika, Luthfiyatul Azizah, et al Result: This is aphysics learning media application comprising several screens, namelysplash, start, tutorial, class selection, play, and exit. Besides, this application is useful for practising physics questions for students preparing for their exams. It has an attractive and simple display which boosts students' interest in learning physics. The use of App Inventor in making this game is very helpful and better because it does not require a deep understanding of coding. Therefore, anyone can make games with this tool. Conclusion: Serious games are built not only for entertainment but for educational purposes.
3	Procedia Computer Science Vol. 2017, 116: 99-106. Doi: 10.1016/j.procs.2017.10.015	Title: Android Based Indonesian Information Culture Education Game Author: Norman Kidi, Bayu Kanigoro, Afan Galih Salman, Yen Lina Prasetio, Indrabudhi Lokaadinugroho, Arief Agus and Sukmandhani Result: The “Merah Putih” game was designed using a user-friendly GUI (Graphic User Interface), where the movement from one screen to another does not confuse users about using available buttons and functions. The GUIin this game is dominated by red, white, and blue colors. Meanwhile, the most common fonts often used are ComicSans MS and Segoe UI. This game uses a button design that is often used daily. Each activity carried out by the player produces feedback.For instance, it vibrates when a question is incorrectly answered, while a sound effect is used to indicatea correct answer. Conclusion: The game application "Merah Putih" adds a puzzle to the Android platform with the theme of Indonesian culture. This game provides information on the culture of a region in Indonesia to Android users through educational games.
4	Procedia Computer Science. 2019; 157: 589 – 595. Doi: 10.1016/j.procs.2019.09.018	Title: Interactive Gamification Learning Media Application for Blind Children in Indonesia Using Android Smartphones Author: Azani Cempaka Saria, Andre Mohammad Fadillaha, Junaidy Jonathana, and Mahendra Rezky David Prabowoa Result: The results of user evaluations can be divided into several points based on five measurable human factors, namely: 1. Study Time The interview results showed all subjects felt that the information presented in this game was quite easy to understand.However, some parts lacked instructions for users, indicating theyfelt confused. 2. Performance Speed Players can respond to every interaction given in the game quickly. 3. User Error Rate The subjects felt helped by the interactions that existed in this game. This is because the available interactions resemble those in screen reader applications. Subsequently, this game can reduce the level of errors made by users. 4. Storage All the information provided through this game is easy to understand, hence, the subjects can painstakingly remember the flow. 5. Subjective Satisfaction

		The interview results showed that all subjects felt motivated to learn to provide answers to the challenging questions on the menu. Apart from that, beta testers find this game very interesting to play. Conclusion: This learning media application is able to increase the knowledge and understanding of blind students. This is because all subjects responded positively to the developed application.
5	Jurnal Pembelajaran Fisika. 2018; 7(1): 54- 61. ISSN 2301-9794.	Title: Pengembangan Media Pembelajaran Ular Tangga Berbasis Android Pada Pokok Bahasan Gejala Pemanasan Global Untuk Pembelajaran Fisika di SMA (Development of Android-Based Snakes and Ladders Learning Media on the Subject of Global Warming Symptoms for Physics Learning in Senior High School) Author: Indah Kurnia Nur Pratiwi Guterres, Sudarti, Maryani, and Pramudya Dwi Aristya Putra Result: In the use of android-based snake and ladder learning media, the percentage of student activity is 80.64% and in the very active category. Meanwhile, the implementation of the use of media with increasing percentages of 89%, 95%, and 96%, as well as the effectiveness in terms of student learning outcomes has an N-Gain value of 0.73. Overall, the Android-based snake and ladder learning media on global warming symptomatic material in Islamic Senior High School (MAN) 2 is valid, practical, and effective. Conclusion: The use of learning media for snakes and ladders based on android games is effective and improves student learning outcomes.
6	JOINCS (Journal of Informatics, Network, and Computer Science) 2020; 3(2). ISSN 2541-5123 (online)	Title: English Introduction Educational Game for Children Based on Android Author: Nunuk Wahyuningtyas and Edo Yonatan Koentjoro Result: This research produced an English educational game for Early Education and Elementary School students in grades 1 to 2.Itaimed to increase their interest in learning English applicable to the Android platform. The development method used in this Jhony Adventure educational game is the ADDIE (Analysis, Design, Developer, Implementation, and Evaluation). Conclusion: The Jhony Adventure educational game is an effective alternative to teaching early childhood and Elementary School students in grades 1-2. This game uses the concept of education as a medium for studying subjects that seem difficult to learn, such as English.
7	Procedia Comput Sci. 2019; 157: 473-478. doi:10.1016/j.procs.2019.09.005	Title: "Pow pow" Interactive Game iIn Supporting English Vocabulary Learning for Elementary Students Author: Wiwik Andreania and Yi Yingb Result: Theplayers are given time to achieve knowledge on how to play the game to achieve goals and earn stars. They can select a theme and play the game for a limited time. Game users can repeat the game to determinetheir progress by recording the time taken. Conclusion: The PowPow game is considered successful in attracting and motivating students' interest in learning English. Furthermore, this mobile application can improve their English vocabulary skills.
8	Eurasia Proc Educ Soc Sci. 2017; 7(2011): 24-29.	Title: An Educational Mobile City Learning Application for Kids Author: Mehmet Ocan and Furkan Goz Result: This app covers several design steps from start to finish. Upon starting the game, a high score is displayedwith instructions and options to create and select an account through the settings options. Conclusion: In conclusion, this game was developed to determinestudents' performance, portability, security, maintainability, integrity, and availability. It ensures students learn vocabulary in different categories such as history, geography, and culture while having fun due to integrated games and education.
9	J Basicedu. 2021; 5(2): 1027-1038. doi:10.31004/basicedu.v5i2.835	Title: Pengembangan Game Edukasi Berbasis Android untuk Meningkatkan Hasil Belajar Siswa di Sekolah Dasar (Android-Based Educational Game Development to Improve Student Learning Outcomes in Elementary Schools) Author: Ririn Windawati and Henny Dewi Koeswanti Result: The use of Android-Based Educational Games to Improve Class IV Student Learning Outcomes has passed the validity test from material and media experts. The percentage obtained from the material expert validation test was 73%, with the assessment criteria categorized as high.Meanwhile, the percentage obtained from the media expert validation test was 97%, in the very high category. Based on the validation test from media and material experts, the learning media in the form of Android-Based Educational Games to Improve Learning Outcomes Theme 7 for Class IV Students is feasible. Conclusion: Learning media in the form of Android-Based Educational Games to Improve Learning Outcomes Theme 7 for Class IV Students is feasible. The limitations are that it can only be used on Android smartphones, with a focus ona theme comprising 7 sub-themesof Indonesian language and Natural Science lessons. Furthermore, a large enough data quota is required to install an Android-based educational game application.
10	JIPI (Jurnal Ilmiah Penelitian dan Pembelajaran Informatika) Vol.05 No. 01, 2020: 35-44.E-ISSN: 2540- 8984	Title: Pengembangan Media Pembelajaran Game Edukasi Berbasis Android Pada Mata Pelajaran Fisika Untuk Siswa Kelas XI di SMAN 1 Tulungagung (Development of Android-Based Educational Game Learning Media in Physics Subjects for Class XI Students at the State Senior High School 1 Tulungagung)

		Author: Fahrur Rozi and Ayunda Krista Result: After completing the application prototype creation process, the last stage is to test the quality based on ISO 25010, which includes aspects of Functional Suitability. This process is carried out using the Media Test with two learning media experts at STKIP PGRI Tulungagung and Material Test by a physics teacher. It includes Portability, Usability, and PerformanceEfficiency carried out by students, atthe eligibility of 94% and "Very Feasible", as shown in Table 3. According to Table 7, this application also has a usability standard of 90% and is in the "Very Eligible" category. Conclusion: The trial results of this application were carried out with students of the State Senior High School 1 Tulungagung. The usability trial result has a percentage of 81%, therefore this educational game is declared suitable for use as a learning medium.
11	Jurnal Pembelajaran Fisika. 2018; 7(1): 56-61. doi:10.2991/icei-19.2019.53	Title: Pengembangan Media Pembelajaran Ular Tangga Berbasis Android Pada Pokok Bahasan Gejala Pemanasan Global Untuk Pembelajaran Fisika di SMA (Development of Learning media Android Based Snakes and Ladders on The Mains of Global Heating Symptoms for Physics Learning inSenior High School) Author: Indah Kurnia Nur Pratiwi Guterres, Sudarti, Maryani, and Pramudya Dwi Aristya Putra Result: The descriptive analysis illustrated that, in general, the interest in learning physics for class VIII Junior High School (SMP) 3 is in the high category. The interview also showed that students felt happy taking physics lessonsby playing Snakes and Ladders. They felt challenged to collect as many points/scores as possible, hence, they studied harder. Conclusion: Students' interest in learning science and physics through the snakes and ladders playing method is generally in the high category. Therefore, their attention and feeling ofpleasuretowards the lesson are in the high and very high categories, respectively.
12	Atlantis Press Advances in Social Science, Education and Humanities Research, 2020;387(Icei):226-231. doi:10.2991/icei-19.2019.53	Title: An Android Based Game for Children to Learn Fraction Author: Ika Rahmawati and Shela Dwi Ariyanti Result: Happy Chef game development (Android-based) for grade IV Elementary School uses the ADDIE development model, which consists of the following: 1. The analysis stage analyzes student books, educators, literature research, and learning media. 2. The design stage designs material and media products in the form of flowcharts and storyboards. 3. The development stage used to realize the design plan in the form of Happy Chef based on Android game media. 4. The implementation stage was used to test the product for fourth-grade students of the UNESA Laboratory. Happy Chef game media (Android-based) for the fourth grade of Elementary School based on the test subjects' questionnaire and observations were in percentages of 87.1% and 95%. Conclusion: Happy Chef game media (Android-based) is very suitable to be used as a learning media.
13	J Phys Conf Ser. 2021; 1869(1): 8-12. doi:10.1088/1742-6596/1869/1/012089	Title: Android game: Education Javanese vocabulary Author: R Wijayanti, S Muntomimah, and R Khoirunnisak Result: This application has been tested by media experts, Early Education experts, Javanese language experts, Early Education teachers. A total of 30 questionnaires are divided into five criteria as follows: 1) suitability of materials Of the six items given, four were declared very feasible, and two were eligible. 2) material depth and width The second assessment of the depth and width criteria, of the five question items, two have easy criteria, and three are very feasible. 3) language used It comprises eight items, with six in the very feasible criteria and two eligible. 4) media display Of the nine-question items, seven are in the decent criteria, and three are in the very decent. 5) implementation Implementation consists of two question items with reasonable criteria. Based on the questionnaire analysis from media and material experts, physics teachers and students, 90.25% were categorized as very feasible. Therefore, in terms of appearance and technicality, the learning media developed is feasible to be applied as a medium for learning Javanese vocabulary for early childhood using Android games. The utilization of android media is very effective for learning and can also increase students' motivation to participate in learning activities. Conclusion: Android games are decent and can be used as a medium to teach children aged 5 to 6 years Javanese vocabulary.
14	Sisforma. 2017; 3 (2): 44. doi:10.24167/sisforma.v3i2.844	Title: Children Safety: Education Game for Child's Sex Education Author: FajarAs'ari, Fx. HendraPrasetya, ST., MT, and Dr. Ridwan Sanjaya Result: In the survey, respondents' opinions on the Children Safety game are as follows: 1. It is easy to play by adults, hence, parents/teachers can accompany and teach children how to play the game. 2. It can be used as a medium to teach sex education. 3. It is relevant for teaching childrensex education. 4. Games can be a medium for teaching children in grades 1-3 sex education. 5. Some respondents stated that children's sex education materials lacked human genitals. The game only implicitly shows the genitals' location through the part of the body where they are located. This is because not all parents are ready to show their genitals explicitly even through sketch drawings to children.

		Conclusion: Game Children Safety can be a means to help deliver sex education, which is also relevant.
15	J Obs J Pendidik Anak Usia Dini. 2022;6(4):3613-3628. doi:10.31004/obsesi.v6i4.2170	Title: Efektivitas Aplikasi Sex Kids Education untuk Mengenalkan Pendidikan Seks Anak Usia Dini (The Effectiveness of Sex Kids Education Applications to Introduce Early Childhood Sex Education) Author: Misselina Madya Gerda, Siti Wahyuningsih,and Nurul Kusuma Dewi Result: Based on the recapitulation of the percentage assessment at each stage, the feasibility of learning media for the Sex Kids educational game application found satisfactory results. It showed an increase in the percentage of assessment results at a value of 75% and 77%in the small and large-scale trials, respectively. The feasibility assessment showed that six stages obtained an average final score of 88% and were categorized in the "Very Feasible" learning media. Implementing the Sex Kids Education application shows an increase in the pretest and posttest as well as the small and large-scale tests.Therefore,it can be concluded that the application development is very feasible. This is supported by the product validation tests conducted by early childhood learning media, sex education, informatics and learning practitioners.An average value of 92% was obtained, which was categorized as very feasible to be implemented as a learning medium for introducing sex education for early childhood aged 5-6 years. Conclusion: The Sex Kids Education application is feasible to develop as a learning medium. This application is also declared effective in increasing children's knowledge about early childhood sex education and can stimulate their cognitive development.
16	Journal of Health, Education and Literacy (J-Healt) 2022; 4: 72 - 78. https://doi.org/10.31605/j-healt.v2i1	Title: Pengaruh Pendidikan Kesehatan Metode Permainan Spinning Wheel terhadapPengetahuan Pendidikan Seksual pada Siswa SMPS Plus Karya Persada (The Effect of Health Education on the Spinning Wheel Game Method on Knowledge of Sexual Education in Students of Private Junior High School Plus Karya Persada) Author: Erwin Saputra, Muslifah, Arnia, and Nur Juliana Result: There is a significant effect of sexual education on the spinning wheel method on students' knowledge at the Private Junior High School Plus Karya Persada obtained from p-value <0.05 or equal to 0.000. Therefore, the spinning wheel method can be given to students to increase their knowledge of sexual education to prevent sexual violence in adolescents. Conclusion: The development of an android-based spinning wheel method to facilitate learning media increases students' knowledge about sexual education.
17	Jurnal Sisfotek Global. 2016; 6 (1).	Title: Animasi Sex Education Untuk Pembelajaran dan Pencegahan Pelecehan Seksual Pada Anak Usia Dini (Studi Kasus di TK Kartini) (Sex Education Animation for Learning and Prevention of Sexual Harassment in Early Childhood (Case Study at Kartini Kindergarten)) Author: Muhammad Iqbal Hanafri, Ami R Mariana , and Carma Suryana Result: This research designed and built an animated sex education media for learning and preventing sexual harassment in early childhood studies in Kartini Kindergarten in the form of 2D animation. It was carried out after analyzing, designing and testing the processes. This animation media has been designed and built for children between the ages of 3 to 5 years. Conclusion: Implementing sex education animation media for learning and preventing sexual harassment in early childhood is a new breakthrough. This is because it is now a medium for delivering interesting information and learning while assisting teachers in delivering material at Kartini Kindergarten's learning process.
18	IOP Conf. Series: Materials Science and Engineering 835. 2020; doi:10.1088/1757-899X/835/1/012040	Title: Designing Android-Based Education Game Aksara Jawa (Javanese Script) Using Shuffle Random Algorithm Author: Nugroho Dwi Saputro, Triana Romadhani, and Febrian Murti Dewanto Result: This Android-Based Java Script Educational Game with Randomized Shuffle Algorithm has undergone a User Acceptance Test process conducted on four respondents taken from users and principals with 3 test areas: usability, ease of use, and format. The benefits of this game, as seen in productivity, performance, effectiveness, and usability, have a percentage value of 82.9%, below 85%. This occurs because some respondents still feel that the Javanese script of educational games is unproductive and less effective. In terms of productivity, Javanese educative games cannot completely replace conventional Javanese scripts, and the effectiveness of this game has not been tested. The use field has two analyzes whose percentage valueshave reached 87.5%. This is because respondents feel that this educational game makes learning the Javanese script easier to listen, remember, memorize, and write. Conclusion: The Android-based Javanese script education game application using the Random Algorithm as a learning medium is feasible to use. The percentage is 100% with black and white box testing. Based on the User Acceptance Test, this application has a good average of 86%.
19	JMIR Serious Games. 2021; 9 (4). DOI: 10.2196/30350	Title: Development and Validation of a Mobile Game for Culturally Sensitive Child Sexual Abuse PreventionEducation in Tanzania: Mixed Methods Study Author: Maria Proches Malamsha, Elingarami Sauli and Edith Talina Luhanga Result: Parents and caregivers showed an interest in the games developed during the survey, each navigating all parts of the game on average. Their confidence level before and after discussing CSAP increased from 3.56 (neutral) to 4.9 (confident). Ability scores calculated based on various topics in CSAP educational talks with children also increased from 5.67 (from 10) to 8.8 (out of 10) after the game was played. Both self-confidence and ability scores were statistically significant (P<.001). All five children were interested in the game and enjoyed the activities provided. Conclusion:

		The HappyToto game can be an effective technology-based intervention to improve the knowledge and skills of parents and children in CSAP education.
20	Prosiding Seminar Nasional Desain dan Arsitektur (SENADA). 2019; 2.	Title: Perancangan Multimedia Interaktif Untuk Materi Perlindungan Anak Terhadap Pelecehan Seksual Berbasis Mobile (Interactive Multimedia Design for Child Protection Materials Against Mobile-Based Sexual Harassment) Author: Dewa Putu Yudhi Ardiana, and Luciana Hendrika Loekito Result: Interactive Multimedia aims to teach children how to avoid sexual harassment. This is because conventional information is often less durable and uses only one medium. Meanwhile, with multimedia, children can be more stimulated. The development of interactive Multimedia uses the Decide, Design, Develop, Evaluate (DDD-E) learning model. The Decide stage is used to set the objectives and program materials. The Design designs the program structure. The Develop stage produces media elements and creates multimedia displays. The Evaluate stage is to check the entire multimedia display process. In the Decide stage, interactive multimedia targets children aged 6 to 10. This age is selected because children already have good language skills at that stage. Interactive Multimedia is designed based on mobile with an Android operating system. Conclusion: Interactive Multimedia was selected because it is better in stimulating the information children. It is designed in the form of a visual novel with 2-dimensional cartoon characters to attract children's interest. The mobile base with the Android operating system was selected because it is widely used and easy to distribute.

The use of Android-based games as learning media contains text, images, audio, and graphics with an interesting storyline. Therefore, by using interactive games media, children's abilities and understanding will be better and capable of improvingtheir learning outcomes more effectively[67].The learning media created will display a more effective and interactive learning process using computer technology compared to previous media[89]. Educational applications used can be online or offline. For instance, in the Game "Tales of Mamochi", the application is offline with an interactive game display[10]. It means that the interactions provided in the game can be responded to quickly because the available interactions resemble those in screen reader applications. Consequently, it can reduce the error rate made by users[1011]. The educational learning widely used is physics[12] through brain teaser learning games[13], English through introduction educational[1], PowPowgame[14], and snakes and ladders[12]. The "Merah Putih" game application is used to learn about the nation's culture and adds a puzzle on the Android platform with the theme of Indonesian culture. "Merah Putih" can provide information about the culture of a region in Indonesia to android users through educational games.[1516] Meanwhile, PowPow and Javanese vocabulary Android educational game[17] are considered successful in attracting students' interest and motivating them to learn the language. This mobile application can improve English and Javanese vocabulary skills[1819].

The Snakes and Ladders gamealso contains a moral message thatone can fall from the bottom. Therefore, one does not need to be arrogant but honest and work hard to succeed while going through stages full of tests. This means that the game also embeds character education in students[20]. Meanwhile, education games to educate kids on sex education are easy for adults to play. Parents/teachers can accompany children to play the game because it is a medium to teach them sex education in grades 1-3 Elementary School[421]. The characteristics of the media needed in early childhood are interesting, innovative, interactive, and fun. This aimsto stimulate aspects of fine motor physical development and media that contain sex education materials of children's cognitive development[4].Another research stated that the learning process based on digital education can stimulate children's curiosity to find new ways to solve problems by creating attraction in the visual space, which in turn increases their satisfaction[22].
A digital-based learning media design for Android-based Sex Kids Education game applications equipped with a screen time feature was used in the journal Effectiveness of Sex Kids Education Applications to Introduce Early Childhood Sex Education. There is a limit of playing time, which is only 30 minutes, adjusted to the American Academic of Pediatrics recommendation, which should be only ≤2 hours per day[4]. The recapitulation of the percentage of assessment results at each stage shows satisfactory results with an increase in small and large scale trials of 75% and 77%, respectively.Based on the percentage of the feasibility assessment, it can be seen that the six stages obtained an average final score of 88% in the "Very Eligible" category for the "Sex Kids Education" Educational Game. Sex education is needed for children to know the function of their reproductive organs from an early age. Therefore, they can avoid sexual deviant behavior[6]. This is a new breakthrough as a medium for delivering interesting information and learning to assist teachers[8]. Behnamnia suggested that creativity is needed in designing digital games for children[22]. It needs to focus on the elements of curiosity, fantasy, challenges, interests and motivation to increase their interest when playing digital games[23]. Several respondents stated that children's sex education materials lacked a way to show human genitalia. The game only implicitly shows the location of the genitals through the part of the body where they are located. This occursbecause not all parents are ready to show the genitals explicitly, even through sketch drawings, to their children[4]. Furthermore, a large enough data quota is needed to install an Android-based educational game application[3].

Conclusion

Games are one of the most popular means of entertainment. Educational games have been specifically designed to develop students' concepts and help them understand practical skills while motivating them. Based on the data and analysis, it is known that the use of Android-based games as learning media contains text, images, audio, and graphics with interesting storylines. The form of the game application in the journal has an interactive display. Educational learning is widely used to teach physics, English and media using brain teasers, English introduction education games, PowPow games and Snakes and Ladders. The nation's culture is learnt using the "Merah Putih" game application. Meanwhile, PowPow and android games education were considered successful in improving English and Javanese vocabulary skills. The education game for children's sex education and its effectiveness shows that this game is easy to play by adults. Parents/teachers can teach them how to play the game. According to several respondents, children's sex education materials lacked a way to show where the human genitalia are located. The game

only implicitly shows the location of the genitals through the part of the body where they are located. This occurs because not all parents are ready to show the genitals explicitly, even through sketch drawings, to their children.

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