Analysis of the Use of Educational Game Media for Science Subjects on Digestive System Material

Safrudin Wahyu Jadmiko[1], Deni Setiawan[1*]

[1] Primary Teacher Education, Faculty of Education and Psychology, Semarang, Universitas Negeri Semarang, Indonesia.

Abstract: Educational games are games that are used in the learning process, as a form of technology adaptation in the world of education to help teachers improve the learning process in the classroom. Researchers conducted research with the aim of analyzing the use of educational game media during learning; analyze the impact of using educational game media; how important educational game media is in class V science and science learning at Japeledok State Elementary School. This research uses descriptive qualitative research methods. This research was carried out at SDN Japeledok, Pancur District, Rembang Regency. SDN Japeledok has a total of 11 class V students consisting of 7 boys and 4 girls. The data taken from this research are observations, questionnaires, interviews and documentation using triangulation techniques. The results obtained from this research are the use of educational game media in Japeledok Elementary School that have been implemented by class teachers are Wordwall and Quizizz; The impact given after implementing educational game media is an interactive and fun learning experience, training students' thinking skills, increasing interest and motivation to learn, and making students more active in the learning process in class. Overall, educational games have had a lot of positive impacts on students and teachers. Judging from the impact this educational game has, it has an important role in implementing learning. Educational game media not only provides an interesting alternative in education, but also opens up new opportunities to improve the quality of learning and learning experiences for various types of learners.

Keywords: Educational; Game media; Science

Introduction

Globalization brings major changes in the order of people's lives. These changes are driven by the increasing development of science and technology, which has an impact on various sectors of life, including the field of education. With advances in the fields of science and technology, students are faced with conditions of renewal and digitalization in the development of learning resources which include the use of sophisticated electronic devices (Wang, 2023). In connection with the current development of information technology which can have an impact on education, therefore the education sector needs learning media developed from the IT sector (Rahmadani & Muryanti, 2023). Currently, learning media design not only utilizes objects around us but also utilizes the digital world (Haleem et al., 2022; Ratnasari & Haryanto, 2019). In education, one of the new innovations is interactive learning media created through technology (Anggraeny et al., 2020).

In the current era, technological advances are developing very rapidly. This has an influence in the field of education. Searching for information and digging up information is now very easy to access. Students now only need to be directed and straightened

out regarding searching for learning information. The learning carried out by students is directed at formulating problems, practicing analytical thinking. Learning now also emphasizes cooperation or jointly solving problems. In this case, it is in line with Minister of Education and Culture Regulation Number 22 of 2016 concerning the primary and secondary education process to achieve graduates.

In the world, educators must be able to follow current trends or media developments. High quality education is needed to create intelligent humans. In this case, educators must be able to make innovations regarding learning, such as creating interesting and innovative learning media. Lack of use of media during learning so that students have more interest and high motivation to learn so that learning will not be in accordance with what the teacher expects (Pratiwi et al., 2021). The success of learning really depends on educators who have good quality. Educators must also be able to create a conducive learning atmosphere so that students feel comfortable and quickly understand the material provided by the teacher. Law Number 14 of 2005 specifically regulates teachers and lecturers. Article 10 explains the obligations of teachers, including carrying out education and teaching in accordance with competency standards and performance standards, motivating and guiding students, and implementing professional ethics. This refers to the need for educators to be innovative in creating teaching media.

Learning media is a teaching aid that can influence the learning atmosphere, learning conditions, and learning environment that has been conditioned and developed by the teacher (Trisiana, 2020). Learning media is a tool that is really needed by teachers to help students understand a concept when learning, especially media that can be operated by students themselves (Hanannika & Sukartono, 2022). Media is very important in carrying out learning, not because it is an educator's regulations that must be implemented but the use of learning media will increase students' experience for the learning being carried out. Learning media can also be a stimulus for students to want to know what impact it will have on students in carrying out learning. The media expected by teachers is media that is successful in providing understanding from abstract to concrete by visualizing it in various forms such as animations or images which are more easily accepted and understood by students (Auliah et al., 2023). Sari et al. (2023), there are several factors that cause student performance to be affected, such as the use of media used during learning, the presentation of material that is not yet varied, and the presence of several students who dominate the course of learning in class (Coman et al., 2020; Mhlongo et al., 2023).

The learning media used will certainly make it easier for students to understand (Indriani & Desyandri, 2022). The use of educational game media is needed in the current era. Remembering that today's children like to play with gadgets in their daily lives, but gadgets are only used for playing games. Many students are also addicted to playing games so they forget about their time and obligations. In this case, educational games are needed to be a solution for students to learn while playing. Educational games are designed to help people understand concepts, learn knowledge, and develop problem-solving skills while playing games. Educational games are a type of game that is not only for entertainment but contains knowledge that is conveyed to its users (Saptiawan et al., 2021).

In learning at school, the use of learning media is important in efforts to increase learning motivation. The use of technology in the world of education has also become commonplace since the implementation of the independent curriculum. Technological developments and curriculum needs are also factors that cause learning media to continue to develop. The implementation of the independent curriculum also has an impact on the selection of appropriate learning media. In observations made at SDN Japeledok, class V teachers used technology-based learning media such as using LCDs and laptops. The use of this media tends to be games or quizzes for elementary school children. Teachers use educational games such as those available on the Wordwall and Quizizz platforms. The fifth grade teacher at SDN Japeledok is young so he is quite proficient in using ICT.

Research conducted by Akhwani et al. (2022) with the title "Using Home Learning Education Games as a Learning Media for Elementary School Teachers in Magetan Regency shows that home learning educational games can be used in mathematics, science, social studies, language, civics and general materials. However, not all educational games can be applied at elementary school level, because some material is at junior high school level. Here the teacher stated that the home learning edugame material was useful as an alternative in overcoming student boredom. Another research conducted by Vankúš (2021), with the title "Students' Perceptions of the Use of Digital Educational Games in Mathematics Learning" shows that 86% of students agree that the use of educational games makes learning mathematics easier . In research conducted by Patmah et al. (2021), it was stated that the majority experienced improved learning outcomes by using mobile learning application educational games. Thus, researchers conducted research with the aim of analyzing the use of educational game media during learning; analyze the impact of using educational game

media; analyze the importance of educational game media in class V science and science learning at Japeledok State Elementary School.

Method

The research used by researchers is qualitative methods. Qualitative research methods emphasize aspects of understanding in depth a problem or problem rather than looking at problems to generalize (Rusandi et al., 2021). Qualitative Research is an approach to study that follows traditional ways of conducting social, behavioral and health science research. This research uses qualitative research methods which are descriptive in nature. Qualitative descriptive research is a type of research that is included in qualitative research (Koh & Owen, 2000). Qualitative descriptive research presents actual data without any manipulation process. This research was conducted by diving into the field to find valid data.

This research was carried out at SDN Japeledok, Pancur District, Rembang Regency. SDN Japeledok has 11 class V students consisting of 7 boys and 4 girls. In qualitative research, data collection is carried out in natural settings with primary data sources, and data collection methods are mostly participant observation, in-depth interviews, and documentation (Haenssgen, 2019). The data taken from this research are observations, questionnaires, interviews and documentation. Researchers chose to use triangulation techniques. Technical triangulation is checking data on data obtained using different methods or techniques such as comparing the four techniques of observation, interviews, documentation and questionnaires.

Result and Discussion

The results of the research carried out through questionnaires, observations, interviews and documentation, researchers obtained information that referred to the discussion, namely the digestive system material. The results of the questionnaire were distributed to all class V students at SD N Japeledok, with a total of 10 students, with a total of 30 questions to answer 3 problem formulations. Through questions from all the questionnaire questions, the use of educational game media is important, which is shown through the results of the questionnaire where all students stated that its existence had a positive impact. Through questions 1-10 which represent indicators of problem formulation 1, it is stated that all students think that the presence of educational game media makes them comfortable, helps students, makes learning easier, and is preferable compared to other types of learning

media. Before using educational game media, teachers also explain how to use the media, but half of all students do not understand educational game media.

The use of educational game media in elementary schools can be an effective tool for improving student learning in a fun and interactive way (Manesis, 2020). Through educational games, students can explore subjects in an environment that supports exploration and experimentation so that they can be more actively involved in the learning process. In science and science learning, educational games can enable students to understand concepts in a more enjoyable way. Additionally, educational games also allow teachers to support diverse learning styles, as they can adjust the difficulty level to suit each learner's abilities. Thus, the use of educational games in elementary schools not only motivates students to learn, but also helps create an inclusive learning environment and enriches the learning experience.

Through the use of educational game media, teachers realize that the application of educational game media that has been used in learning is not only a tool for learning. A number of positive impacts were also provided during the use of educational game media which was implemented in class V science and science learning at SDN Japeledok. Before deciding to use media, teachers must first innovate in finding media that suits the learning objectives, apart from that, teachers also need to adapt to the learning needs and characteristics of students in their class.

At SDN Japeledok, class V teachers have implemented educational games which are one application of technology-based learning media in the form of Wordwall and Quizizz on digestive system material. Through the Wordwall and Quizizz games, teachers can insert fun games into the middle of learning which are certainly welcomed by students. In implementation, when game media is used the teacher uses an ice breaker in the form of using the Wordwall game between lessons. The use of wordwall itself helps increase students' enthusiasm for learning. Together students can jointly evaluate their learning. By observing students' progress and achievements in the game, teachers can identify areas that require additional attention and provide appropriate guidance. In the ice breaking session using Wordwall the teacher presents questions packaged using games. Students can simultaneously check whether their answers are wrong or right. The teacher at that time can also immediately correct and discuss together.

Apart from that, games in the middle of learning can prevent some of students' bad habits that they shouldn't do during teaching and learning activities, such as joking with other friends, enjoying playing

alone, eating in class, and so on. This helps ensure that everyone Learners get the support they need to reach their full potential. To end the learning, the teacher does not forget to carry out an evaluation using Quizizz. The use of Quizizz itself can be said to be a practice question at the end to test students' understanding of the digestive system material that has been explained by the teacher.

The use of educational game media has a significant impact on students in several ways. First, educational games provide an interactive and fun learning experience, which can increase students' interest and involvement in learning. With increased involvement, students tend to become more focused and students will be more active in the learning process, which in turn increases their understanding of the subject matter. Second, educational game media to encourage students to be able to solve problems, think critically and have collaborative skills. Students learn to face challenges and find solutions through these educational games. This helps develop critical and analytical thinking skills. Third, increase students' interest and motivation in learning. Compared to traditional learning methods, educational games provide a more interactive, fun and challenging learning experience, thereby increasing students' motivation to learn. Fourth, students are more active in discussing in class. Through students' activeness in learning, it is possible to make the learning process carried out by the teacher complete without any material confusion experienced by students. However, it is important to note that the use of educational games in elementary schools must be accompanied by careful monitoring and supervision by teachers. Teachers must ensure that their use does not interfere with effective learning.

Through questions from problem formulation 3, the use of educational game media becomes important. According to the results of interviews conducted with the class V teacher, the use of educational game media is liked and loved by students, which actually has a more positive impact on students' learning development. The teacher also stated that the existence of educational game media makes learning easier and provides a new color for learning in class. According to the teacher, educational game media needs to be implemented for other learning which is proven to attract more students' attention. In the observations made (Abdulrahaman et al., 2020; Smiderle et al., 2020), the researcher observed learning when using educational games and obtained the results that the learning created was more conducive and more observable by students (Bayeck, 2020; Fütterer et al., 2023). Students seem more focused on learning and seem more interested in using educational game media.

In the Independent Curriculum, the use of technology in the form of educational games based on a differentiated approach is very relevant (Kao et al., 2023; Wang et al., 2022). Teachers can use this to create a more challenging and meaningful learning experience for students. Educational games play an important role in education in this modern era (Fauzi et al., 2019). Nowadays, in the era of technology that continues to develop rapidly, educational games have become an effective innovation in learning to facilitate the learning process (Kamalov et al., 2023; Wardoyo et al., 2021). Elementary school children still like things that smell interesting in terms of long-term memory and success in using effective methods (Hidayati & Budiarti, 2022). Educational games are an effective tool for improving the quality of learning for elementary school age children (Cheung & Ng, 2021; Saleh & Ahmed Althaqafi, 2022). Educational games are not only used to transfer knowledge, but can grow and develop skills that will later be needed (Alexiou & Schippers, 2018; Vlachopoulos & Makri, 2017; Xiong et al., 2022). Educational games can not only facilitate cognitive skills, but can facilitate teachers to develop other skills such as social and emotional which are important for the overall future development of students (Darling-Hammond et al., 2020; Hui & Mahmud, 2023). Thus, educational game media is not only used as a learning innovation, but also makes a lot of contribution to the quality of learning and encourages students to become technology-savvy students in the future (Al-Adwan et al., 2023; Nadeem et al., 2023).

Conclusion

Based on the results and discussion and referring to previous research, the author reached the following conclusions: The use of educational game media at SDN Japeledok that was implemented by class V teachers, namely Wordwall and Quizizz. The scale of use is not every time I study science, but several times during one semester; The impact given after the implementation of educational game media is an interactive and fun learning experience, training students' thinking skills, increasing interest and motivation to learn, and making students more active in the learning process in class; Overall, educational games have had a lot of positive impacts on students and teachers. Judging from the impact this educational game has, it has an important role in implementing learning. Educational game media not only provides an interesting alternative in education, but also opens up new opportunities to improve the quality of learning and learning experiences for various types of learners. Educational game media can be an

effective tool in supporting student-centered learning and facilitating their academic and cognitive growth.

Conflicts of Interest
The authors declare no conflict of interest.

References

Abdulrahaman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., Imam-Fulani, Y. O., Fahm, A. O., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, *6*(11), e05312. https://doi.org/10.1016/j.heliyon.2020.e05312

Akhwani, A., Rahayu, D. W., & Djazilan, M. S. (2022). Pemanfaatan Edugame Rumah Belajar Sebagai Media Pembelajaran Guru Sekolah Dasar di Kabupaten Magetan. *Seminar Nasional Pengabdian Kepada Masyarakat 2021*, *1*(1), 169–181. https://doi.org/10.33086/snpm.v1i1.798

Al-Adwan, A. S., Li, N., Al-Adwan, A., Abbasi, G. A., Albelbisi, N. A., & Habibi, A. (2023). "Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms". *Education and Information Technologies*, *28*(11), 15381–15413. https://doi.org/10.1007/s10639-023-11816-3

Alexiou, A., & Schippers, M. C. (2018). Digital game elements, user experience and learning: A conceptual framework. *Education and Information Technologies*, *23*(6), 2545–2567. https://doi.org/10.1007/s10639-018-9730-6

Anggraeny, D., Nurlaili, D. A., & Mufidah, R. A. (2020). Analisis Teknologi Pembelajaran dalam Pendidikan Sekolah Dasar. *FONDATIA*, *4*(1), 150–157. https://doi.org/10.36088/fondatia.v4i1.467

Auliah, N. L., Asrul, A., & Ramadhani, I. A. (2023). Penggunaan Media Interaktif berbasis Animasi Power Point terhadap Hasil Belajar Materi Gaya dan Gerak di Sekolah Dasar. *Jurnal Papeda: Jurnal Publikasi Pendidikan Dasar*, *5*(1), 89–94. https://doi.org/10.36232/jurnalpendidikandasar.v5i1.3667

Bayeck, R. Y. (2020). Examining Board Gameplay and Learning: A Multidisciplinary Review of Recent Research. *Simulation & Gaming*, *51*(4), 411–431. https://doi.org/10.1177/1046878119901286

Cheung, S. Y., & Ng, K. Y. (2021). Application of the Educational Game to Enhance Student Learning. *Frontiers in Education*, *6*, 623793. https://doi.org/10.3389/feduc.2021.623793

Coman, C., Țîru, L. G., Meseşan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, *12*(24), 10367. https://doi.org/10.3390/su122410367

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, *24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Fauzi, A., Yudha, B., Harli, E., Kusmanto, T. H., Rangka, I. B., & Sapriyanti, S. (2019). Developing of TaPe Game App for interactive learning based on DGBL model for students in elementary school. *Journal of Physics: Conference Series*, *1318*(1), 012034. https://doi.org/10.1088/1742-6596/1318/1/012034

Fütterer, T., Hoch, E., Lachner, A., Scheiter, K., & Stürmer, K. (2023). High-quality digital distance teaching during COVID-19 school closures: Does familiarity with technology matter? *Computers & Education*, *199*, 104788. https://doi.org/10.1016/j.compedu.2023.104788

Haenssgen, M. J. (2019). *Data Collection Methods Interdisciplinary Qualitative Research in Global Development: A Concise Guide*. Emerald Publishing Limited. https://doi.org/10.1108/978-1-83909-229-920191004

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

Hanannika, L. K., & Sukartono, S. (2022). Penerapan Media Pembelajaran Berbasis TIK pada Pembelajaran Tematik di Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 6379–6386. https://doi.org/10.31004/basicedu.v6i4.3269

Hidayati, T., & Budiarti, E. (2022). Pengaruh Penggunaan Aplikasi Quizizz Sebagai Game Edukasi Untuk Meningkatkan Kemampuan

Kognitif Anak Usia Dini di TK Anak Bangsa. *Al-Abyadh*, *5*(1), 42–50. https://doi.org/10.46781/al-abyadh.v5i1.502

Hui, H. B., & Mahmud, M. S. (2023). Influence of game-based learning in mathematics education on the students' cognitive and affective domain: A systematic review. *Frontiers in Psychology*, *14*, 1105806. https://doi.org/10.3389/fpsyg.2023.1105806

Indriani, E. & Desyandri. (2022). Pengaruh Game Kahoot Terhadap Minat Belajar Siswa Pada Pembelajaran IPAS Kelas IV di Sekolah Dasar. *Didaktik : Jurnal Ilmiah PGSD STKIP Subang*, *8*(2), 1934–1942. https://doi.org/10.36989/didaktik.v8i2.491

Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. *Sustainability*, *15*(16), 12451. https://doi.org/10.3390/su151612451

Kao, M.-C., Yuan, Y.-H., & Wang, Y.-X. (2023). The study on designed gamified mobile learning model to assess students' learning outcome of accounting education. *Heliyon*, *9*(2), e13409. https://doi.org/10.1016/j.heliyon.2023.e13409

Koh, E. T., & Owen, W. L. (2000). Descriptive Research and Qualitative Research. In *Introduction to Nutrition and Health Research* (pp. 219–248). Springer US. https://doi.org/10.1007/978-1-4615-1401-5_12

Manesis, D. (2020). *Digital Games in Primary Education. In I. Deliyannis (Ed.), Game Design and Intelligent Interaction*. IntechOpen. https://doi.org/10.5772/intechopen.91134

Mhlongo, S., Mbatha, K., Ramatsetse, B., & Dlamini, R. (2023). Challenges, opportunities, and prospects of adopting and using smart digital technologies in learning environments: An iterative review. *Heliyon*, *9*(6), e16348. https://doi.org/10.1016/j.heliyon.2023.e16348

Nadeem, M., Oroszlanyova, M., & Farag, W. (2023). Effect of Digital Game-Based Learning on Student Engagement and Motivation. *Computers*, *12*(9), 177. https://doi.org/10.3390/computers12090177

Patmah, F., & Mira, R. (2021). Efektifitas Penggunaan Games Edukasi untuk Meningkatkan Kemampuan dan Hasil Belajar Siswa dengan Aplikasi Mobile Learning pada Mata Kuliah Computer Programming. *Informasi (Jurnal Informatika Dan Sistem Informasi)*, *13*(1), 80–96. https://doi.org/10.37424/informasi.v13i1.74

Pratiwi, A., Hikmah, F., Adiansha, A. A. & Suciyati. (2021). Analisis Penerapan Metode Games Education dalam Meningkatkan Motivasi Belajar Siswa Sekolah Dasar. *JagoMIPA: Jurnal Pendidikan Matematika Dan IPA*, *1*(1), 36–43. https://doi.org/10.53299/jagomipa.v1i1.27

Rahmadani, P., & Muryanti, E. (2023). Pengaruh Game Edukasi "Secil" terhadap Keterampilan Membaca Permulaan Anak Usia Dini di Taman Kanak-kanak. *As-Sabiqun*, *5*(4), 948–956. https://doi.org/10.36088/assabiqun.v5i4.3520

Ratnasari, D., & Haryanto, H. (2019). Analysis of Utilization of Gadgets as Effective Learning Media in Innovation Education to improve Student Learning Achievement. *KnE Social Sciences*. https://doi.org/10.18502/kss.v3i17.4671

Rusandi & Rusli, M. (2021). Merancang Penelitian Kualitatif Dasar/Deskriptif dan Studi Kasus. *Al-Ubudiyah: Jurnal Pendidikan Dan Studi Islam*, *2*(1), 48–60. https://doi.org/10.55623/au.v2i1.18

Saleh, A. M., & Ahmed Althaqafi, A. S. (2022). The Effect of Using Educational Games as a Tool in Teaching English Vocabulary to Arab Young Children: A Quasi-Experimental Study in a Kindergarten School in Saudi Arabia. *SAGE Open*, *12*(1). https://doi.org/10.1177/21582440221079806

Saptiawan, I. K. H., Suardika, I. G., & Rudita, I. M. (2021). Game Edukasi Puzzle Pengenalan Alat Musik Tradisional Bali Berbasis Android. *Jurnal Fasilkom*, *11*(1), 1–6. https://doi.org/10.37859/jf.v11i1.2526

Sari, N., Irwan, I., & Candra, A. A. (2023). Pengaruh Penggunaan Media Pembelajaran Game Edukasi Berbasis Kahoot Terhadap Kemampuan Berpikir Kritis Siswa Pada Mata Pelajaran PPKN Di Kelas X Perhotelan SMK Negeri 6 Kota Jambi. *Academy of Education Journal*, *14*(2), 606–615. https://doi.org/10.47200/aoej.v14i2.1815

Smiderle, R., Rigo, S. J., Marques, L. B., Peçanha De Miranda Coelho, J. A., & Jaques, P. A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments*, *7*(1), 3. https://doi.org/10.1186/s40561-019-0098-x

Trisiana, A. (2020). Penguatan Pembelajaran Pendidikan Kewarganegaraan Melalui Digitalisasi Media Pembelajaran. *Jurnal Pendidikan Kewarganegaraan*, *10*(2), 31. https://doi.org/10.20527/kewarganegaraan.v10i2.9304

Vankúš, P. (2021). Influence of Game-Based Learning in Mathematics Education on Students' Affective Domain: A Systematic Review. *Mathematics*, *9*(9), 986. https://doi.org/10.3390/math9090986

Vlachopoulos, D., & Makri, A. (2017). The effect of games and simulations on higher education: A systematic literature review. *International Journal of*

Educational Technology in Higher Education, *14*(1), 22. https://doi.org/10.1186/s41239-017-0062-1

Wang, L.-H., Chen, B., Hwang, G.-J., Guan, J.-Q., & Wang, Y.-Q. (2022). Effects of digital game-based STEM education on students' learning achievement: A meta-analysis. *International Journal of STEM Education*, *9*(1), 26. https://doi.org/10.1186/s40594-022-00344-0

Wang, M. (2023). Effects of Touch-type Online Educational Games on Learners' Learning Motivations. *International Journal of Emerging Technologies in Learning (iJET)*, *18*(06), 4–16. https://doi.org/10.3991/ijet.v18i06.37817

Wardoyo, C., Satrio, Y. D., Narmaditya, B. S., & Wibowo, A. (2021). Do technological knowledge and game-based learning promote students achievement: Lesson from Indonesia. *Heliyon*, *7*(11), e08467. https://doi.org/10.1016/j.heliyon.2021.e08467

Xiong, Z., Liu, Q., & Huang, X. (2022). The influence of digital educational games on preschool Children's creative thinking. *Computers & Education*, *189*, 104578. https://doi.org/10.1016/j.compedu.2022.104578