https://journal.ypidathu.or.id/index.php/jssut/
P - ISSN: 3026-5959
E - ISSN: 3026-605X

The Role and Benefits of Seamless Learning in Improving Primary School Children's Learning Achievement

Wa Ode Riniati[1]
[1]Universitas Muhammadiyah Buton, Indonesia

ABSTRACT

Background. Technological advancements have revolutionized education, particularly in elementary schools, offering novel avenues for learning. Seamless Learning, by seamlessly blending classroom and digital learning experiences, emerges as a promising avenue to enhance elementary students' academic success.

Purpose. This research aims to identify effective learning strategies and models using the Seamless Learning approach. Through a deeper understanding of how technology and an integrated learning environment can influence learning outcomes, it is hoped that concrete recommendations will emerge to improve learning practices in elementary schools.

Method. This study uses quantitative surveys to assess Seamless Learning's effect on elementary students' academic success. It involves 30 PGSD and PGMI students who completed the PPL, alongside experienced SD teachers. Data collection occurs through WhatsApp questionnaires, with analysis conducted using the Miles Huberman model.

Results. The results of the questionnaire analysis showed that the majority of respondents expressed positive perceptions of the use of Seamless Learning in school children's learning base. The majority of respondents use technology regularly, feel enthusiastic, and feel improvements in understanding, applying, and improving their learning achievement through this approach.

Conclusion. Overall, this research confirms the great potential of using Seamless Learning in increasing student engagement and learning achievement in school base. However, continuous efforts are needed to optimize the use of Seamless Learning so that it can provide maximum benefits for learning in elementary schools, as well as prepare students to better face the demands of the modern world.

KEYWORDS

Learning Achievement, Primary School Children's, Seamless Learning

INTRODUCTION

Education at the basic level, especially at elementary school, is an important foundation in forming children's character and academic abilities (Yousef, 2021). This is where the initial learning process begins, and learning achievement at this level plays a crucial role in determining future academic success (A Population-Level Analysis of Associations between School Music Participation and Academic Achievement"," 2020). However, even though basic education is considered a crucial early stage, there are still challenges that need to be overcome to ensure that every child can reach his or her optimal learning potential.

Citation: Riniati, O. W. (2024). The Role and Benefits of Seamless Learning in Improving Primary School Children's Learning Achievement. *Journal of Social Science Utilizing Technology*, *2*(1), 153–165. https://doi.org/10.70177/jssut.v2i1.814

Correspondence:

Wa Ode Riniati,
riniatiwaode@gmail.com

Received: April 17, 2024

Accepted: April 22, 2024

Published: May 1, 2024

One of the main challenges in basic education is ensuring an integrated and consistent learning experience for children (Iivari et al., 2020). Along with the development of information and communication technology (ICT), there has been a paradigm shift in the learning process (Alaloul et al., 2020). This is where the concept of Seamless Learning plays an important role. Seamless Learning carries the idea that learning must be continuous, occur anywhere, anytime, and with the help of whatever tools are available.

With Seamless Learning, learning is no longer limited to the classroom, but extends to the child's surrounding environment, including the home and community (Parrish et al., 2022). This means that learning is no longer interrupted when children leave the classroom, but rather continues and is integrated with everyday activities. This creates opportunities to deepen understanding of concepts, apply knowledge in real contexts, and broaden children's horizons. However, even though the potential of Seamless Learning is very promising, its application is still limited and has not been fully optimized, especially at the basic education level (Glahn & Gruber, 2020). Technology adoption in learning still tends to be fragmented, with curricula that may not be fully integrated with available digital resources. This results in a gap between learning experiences inside and outside the classroom.

By understanding how Seamless Learning can overcome the challenges faced in basic learning, more effective and relevant learning strategies can be created (Lapitan et al., 2021). It's not just about increasing academic achievement, but also establishing learning independence, collaborative skills, and adaptation to future technological changes. In conclusion, combining Seamless Learning principles with basic education has the potential to change the learning paradigm (Zhao et al., 2020). By ensuring continuous and integrated learning experiences, it is hoped that each child can achieve optimal learning achievement in elementary school, which in turn will form a strong foundation for their future success.

In the context of the inverted pyramid of educational background, identified several problems that underlie the need for this research. First, although the learning process is a key element in children's development, there is often a misalignment between the content taught at school and the learning environment outside the classroom (French et al., 2020). This raises questions about the effectiveness of discontinuous and fragmented learning. The second problem faced is inefficiency in the use of information and communication technology (ICT) in the learning process. Although ICT has become an integral part of modern life, there is not yet adequate integration of this technology with the curriculum in primary schools (Tariq et al., 2020). This causes a tendency for children to experience gaps in access and utilization of existing learning resources.

Apart from that, the lack of parental involvement in supporting their children's learning process is also a serious problem. Parents have an important role in creating a conducive learning environment at home, but sometimes a lack of understanding or limited time becomes an obstacle in supporting children's learning process at home (Garbe et al., 2020). This research aims to overcome these problems by exploring the role and benefits of Seamless Learning in improving the learning achievement of elementary school children. By harmoniously integrating learning inside and outside the classroom, it is hoped that a more consistent and comprehensive learning experience can be created for children.

Previous research discussing the use of augmented reality technology in museums generally focuses on scientific aspects. Although there has been exploration into the use of wearable technology in English language learning, there is still much to be researched. This study introduces the use of smart glasses in an English-language dinosaur exhibition at the Museum of Natural Sciences and examines their impact on learning motivation. The results show that the use of smart glasses significantly increases learning effectiveness and motivation compared to the use of tablets. The interaction between learning strategies and learning styles influences learning effectiveness, but does not have a significant effect on motivation. Visual students tend to be more influenced by learning motivation than auditory and kinesthetic students (H.-R. Chen et al., 2023).

Furthermore, previous research aimed to explore the smooth use of mobile media to facilitate student learning in developing spiritual potential, self-control, personality and intelligence, as well as noble character. Integration of Islamic values and science in learning natural phenomena for millennial students using information technology from the available learning environment. The results show significant differences in learning outcomes between students who use mobile media smoothly and those who do not. This integration enhances students' skills, abilities, and knowledge, and encourages them to complete self-created projects and report on meaningful learning activities. Efforts to integrate Islamic values and science are important for developing the knowledge and ethical character of millennial students, as in Islam education is a determining factor in the quality of a child's religion (Fahyuni et al., 2020).

The latest previous research aims to analyze and understand the learning management system effectively through a smooth learning approach at the Nurul Anwar Islamic Elementary School. This research uses a qualitative case study approach. Data collection techniques are carried out through observation, interviews and documentation. Meanwhile, data analysis was carried out through the stages of data display, data reduction and drawing conclusions. The research results show that learning system management through a smooth learning approach at Nurul Anwar Islamic Elementary School in making learning effective is carried out by; 1) Friendly users, 2) User interface, 3) Parental involvement, 4) learning with online learning systems, off-line, and mobile teachers (rolling). This research has important implications for teachers in utilizing various existing and available resources to make their learning as effective as possible (Mahmud et al., 2021).

From previous research, it appears that technology integration, such as the smooth use of mobile media and augmented reality, can increase the effectiveness of learning in elementary schools. These results underline the importance of a seamless learning approach in producing better learning, by strengthening student engagement and integrating religious and scientific values. In relation to the research objectives, these findings provide encouragement to identify effective learning strategies and models that adopt a seamless learning approach, so that they can improve learning practices in elementary schools in a holistic and sustainable manner.

The main objective of this research is to identify effective learning strategies and models using the Seamless Learning approach. Through a deeper understanding of how technology and an integrated learning environment can influence learning outcomes, it is hoped that concrete recommendations will emerge to improve learning practices in elementary schools. Apart from that, this research also aims to increase the role of parents in supporting children's learning at home.

By involving parents as partners in the integrated learning process, it is hoped that stronger support can be created for children's academic development. It is also hoped that this research can provide new insights for the development of educational policies, especially in terms of the integration of technology in the learning process in elementary schools. By having a more comprehensive understanding of the challenges and opportunities in adopting Seamless Learning, a policy framework that supports sustainable learning transformation can be built.

Finally, this research will also provide a basis for further research in developing learning methods and techniques that suit the needs of elementary school children. By applying a holistic and comprehensive research approach, it is hoped that momentum will be created for innovation in learning practices that can enrich children's learning experiences.

RESEARCH METHODOLOGY

This research methodology adopts a quantitative approach with a survey model to investigate the role and benefits of Seamless Learning in improving the learning achievement of elementary school children (Qalati et al., 2021). The research design included detailed procedures to ensure the accuracy and validity of the results. The research objects consisted of 30 students majoring in Elementary School Teacher Education (PGSD) and Madrasah Ibtidaiyah Teacher Education (PGMI) who had completed the Field Experience Program (PPL), as well as several experienced Elementary School (SD) teachers.

The research procedure began with development questionnaire containing questions relevant to the research topic. This questionnaire was then distributed to respondents via a WhatsApp group that had been created specifically for this research. After the data was collected, analysis was carried out using the Miles Huberman model, which includes the stages of data collection, data reduction, and drawing conclusions.

Data collection was carried out by collecting answers from questionnaires that had been distributed to PGSD and PGMI students as well as several elementary school teachers. After the data is collected, data reduction is carried out by analyzing and grouping the data according to the themes and patterns that emerge. The final stage is drawing conclusions based on the results of the data analysis that has been carried out.

The analysis technique uses the Miles Huberman model, which provides a systematic approach to organizing and analyzing quantitative data (Lichtenstein & Rucks-Ahidiana, 2023). This model allows researchers to identify patterns, trends, and relationships between the variables that have been studied. By using this analysis technique, it is hoped that a relationship can be found between the use of Seamless Learning and the learning achievement of elementary school children, as well as the benefits obtained from this learning approach in that context.

RESULT AND DISCUSSION

Seamless Learning

Discussion of Seamless Learning is an important topic in the context of modern education (Safiah et al., 2020). Seamless Learning refers to a learning approach that integrates learning experiences inside and outside the classroom in a continuous and connected manner (Glahn & Gruber, 2020). This definition of Seamless Learning involves the use of technology to create a seamless learning flow, where students can learn anytime, anywhere, and using various types of

devices or media. For example, students can start learning in class with a teacher, continue learning at home using applications or digital resources, and even expand their learning by conducting field exploration in their surrounding environment.

Implementing Seamless Learning can be done in various ways, depending on the context and specific educational needs (Voon et al., 2020). One example of this implementation is by using an online learning platform that is integrated with applications and mobile devices, so that students can access learning materials anywhere. For example, a school may use an online learning platform that allows students to access learning videos, online assignments, and discussion forums from their own devices.

Apart from that, implementing Seamless Learning can also involve the use of augmented reality or virtual reality (VR) technology to enhance the learning experience (Childs et al., 2024). For example, in history learning, students can use augmented reality applications to virtually visit historical locations, view historical artifacts, and gain a more immersive learning experience. With this technology, learning is no longer limited to textbooks and whiteboards in the classroom, but becomes a more interactive and immersive experience (Kuhail et al., 2022).

Implementation of Seamless Learning also involves the teacher's proactive role in designing and compiling technology-integrated learning (Olsen et al., 2021). Teachers need to be facilitators who are able to direct students in using the various learning resources available, both online and offline (Asghar et al., 2022). They also need to be skilled in integrating values and learning objectives with continuous learning experiences, so that students can understand the relationship between the concepts studied and everyday life.

Apart from that, the role of schools and educational institutions in supporting the implementation of Seamless Learning is also very important (Lubis et al., 2024). Schools need to provide access to adequate technological infrastructure, such as fast internet connections and adequate mobile devices (Cahyadi et al., 2022). Apart from that, training and professional development for teachers and school staff is also needed to increase their understanding and skills in using technology for learning (Popova et al., 2022).

However, in implementing Seamless Learning, it is also necessary to pay attention to the challenges and obstacles that may arise. One of them is the issue of accessibility, where not all students have the same access to technology and online learning resources (Aboagye et al., 2020). Apart from that, it is also necessary to pay attention to the privacy and security aspects of student data when using technology for learning.

However, with proper implementation and adequate support, Seamless Learning has great potential to increase learning effectiveness, expand educational accessibility, and prepare students to face future challenges. By utilizing technology as a tool to create a seamless and connected learning flow, we can create a learning environment that is more dynamic, collaborative, and relevant to students' needs in this digital era (Ameen et al., 2021).

Seamless Learning in Improving the Learning Achievement of Elementary School Children

Seamles Learning is a concept that supports the continuous and connected integration of learning experiences inside and outside the classroom (Safiah et al., 2020). In the context of

improving the learning achievement of elementary school children, Seamless Learning offers a holistic and integrated approach to facilitate more effective and relevant learning (Sancar et al., 2021). This definition of Seamless Learning includes the use of technology as a tool to create a seamless learning flow, where the learning experience is no longer fragmented between the classroom and the student's daily environment.

For example, in mathematics learning, students can use interactive mathematics applications to complement learning carried out in class (Buentello-Montoya et al., 2021). They can also take advantage of the environment around them, for example, by observing nature to learn geometric concepts. With Seamless Learning, the learning experience becomes more open and flexible, allowing students to learn according to their individual learning styles and needs.

In addition, Seamless Learning also allows for the integration of values and learning objectives with students' daily lives (Z. Chen et al., 2021). For example, in learning about the environment, students can carry out field projects to identify and solve environmental problems around their school. Thus, learning becomes not only about understanding academic concepts, but also about applying knowledge in real contexts.

After distributing the questionnaire, the following analysis results were obtained, based on the questionnaire distributed regarding the first question, namely, How often do you use technology in the learning process in class? With the following answer options: Every day, Several times a week, Rarely and Never. With the following answer results:

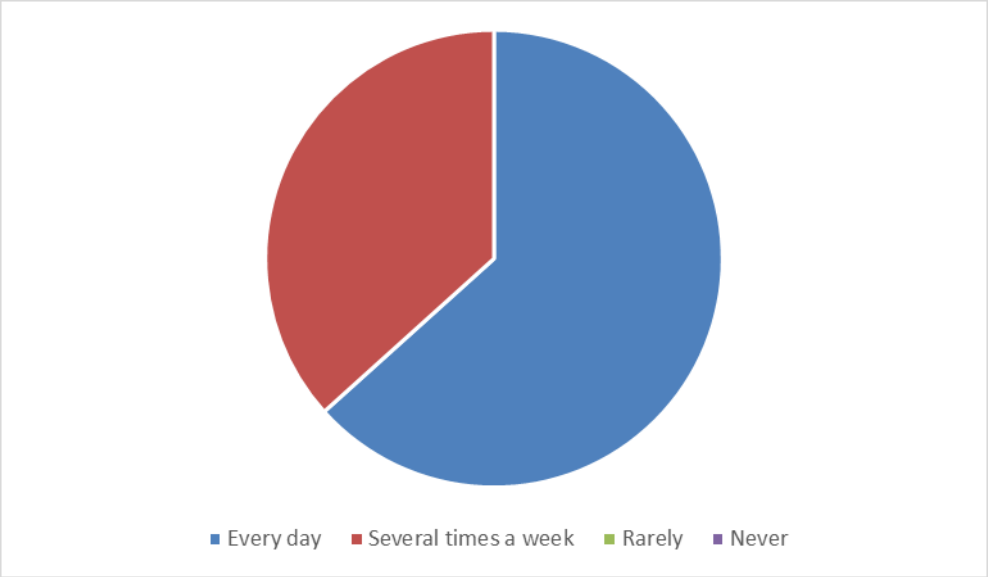

Figure 1. Use of technology in the classroom learning process

From the results of the questionnaire analysis regarding the use of technology in the learning process in the classroom, it can be concluded that the majority of respondents actively utilize technology in their daily learning activities. With 19 out of 30 respondents (63%) using technology every day, and another 11 respondents (37%) using technology several times a week, there is a fairly widespread adoption of the use of technology in educational contexts among respondents. This shows that today's elementary schools have integrated technology into their learning process,

which can be a strong foundation for the implementation of innovative learning strategies such as Seamless Learning.

The regular use of technology in classroom learning reflects awareness of the importance of utilizing digital tools to increase learning effectiveness. With technology, teachers can create more engaging and relevant learning experiences for students, as well as enable greater accessibility to educational resources. Therefore, this understanding will be important in designing learning strategies that optimize the use of technology, including the implementation of the Seamless Learning approach, to improve the learning achievement of elementary school children holistically.

The next question is, what is your level of involvement in learning outside the classroom using technology? With the following answer options: Very active, Quite active, Not very active and Not active. With the following answer results:

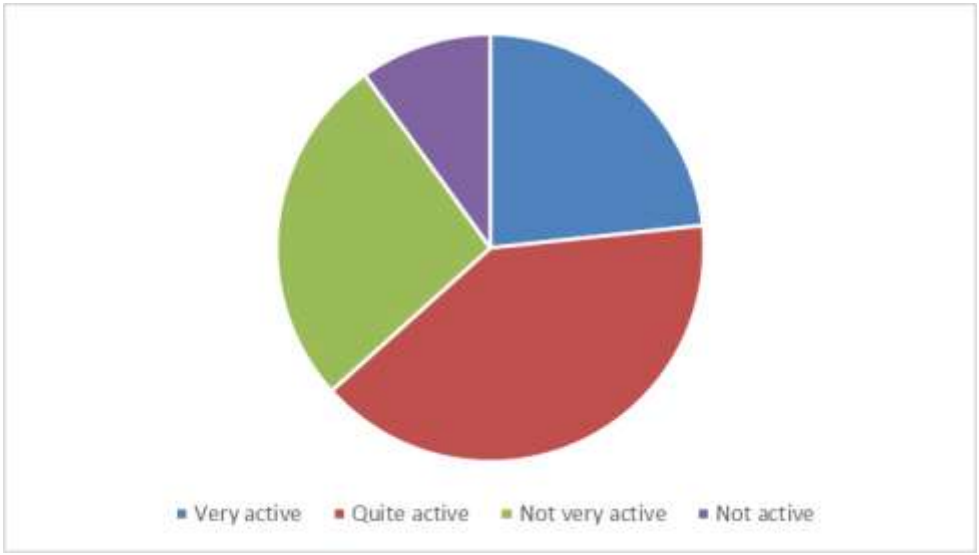

Figure 2. Level of responden's engagement in learning outside the classroom using technology

Based on the results of questionnaire analysis regarding the level of involvement in learning outside the classroom using technology, it appears that the majority of respondents showed a fairly active level of involvement. Of the 30 respondents, 12 people (40%) stated quite active involvement, followed by 7 people (23%) who stated very active involvement. Meanwhile, there were 8 people (27%) who indicated less active involvement, and 3 people (10%) who said they were not active. This shows that the majority of respondents are involved in learning outside the classroom using technology, although the level of involvement can vary from one individual to another.

The importance of active involvement in learning outside the classroom using technology shows awareness of the role of technology in supporting a more flexible and integrated learning process. With active engagement, students have the opportunity to expand their learning experiences beyond the confines of the classroom, as well as increase accessibility to the various learning resources available online. Therefore, the role of teachers in encouraging and facilitating student involvement in learning outside the classroom using technology becomes very important in the context of developing learner-oriented learning strategies in the digital era.

Next question, Do you feel that learning with the Seamless Learning approach makes you more enthusiastic about the learning process? With the following answer options: Strongly agree, Agree, Disagree and Strongly disagree. With the following answer results:

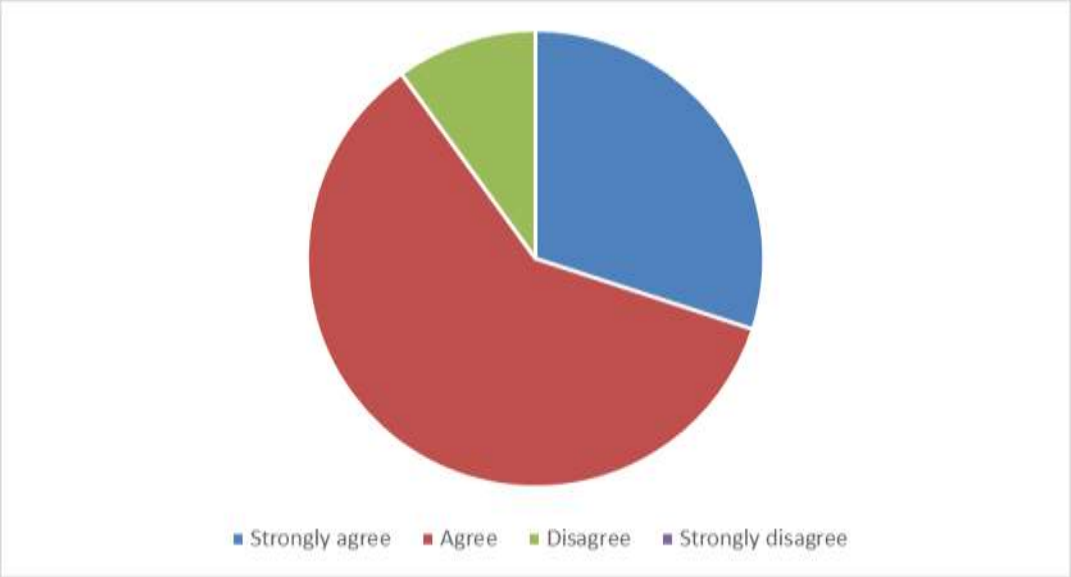

Figure 3. Learning participation with the Seamless Learning approach makes respondents more enthusiastic in the learning process

Based on the results of questionnaire analysis regarding perceptions of learning using the Seamless Learning approach, the majority of respondents showed a high level of enthusiasm for the learning process. Of the 30 respondents, 9 people (30%) strongly agreed that learning using the Seamless Learning approach made them more enthusiastic. Meanwhile, 18 people (60%) agreed with this statement. Only 3 people (10%) said they did not agree with this statement. These results indicate that the majority of respondents felt that the Seamless Learning approach sparked a higher level of enthusiasm in their learning process. This emphasizes the importance of implementing innovative and integrated learning approaches, such as Seamless Learning, in increasing student motivation and involvement in the learning process.

Next question, How effective do you think the use of technology in learning is to understand new concepts? With the following answer options: Very effective, Effective, Less effective and Not effective. With the following answer results:

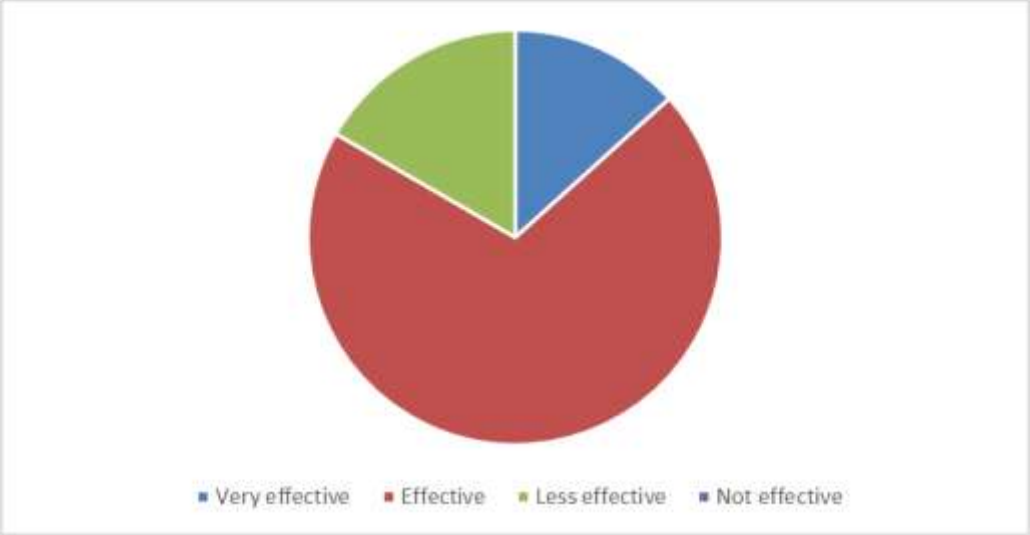

Figure 4. Effectiveness of using technology in learning to understand new concepts

Based on the results of questionnaire analysis regarding the effectiveness of using technology in learning to understand new concepts, the majority of respondents stated that the use of technology was considered effective. Of the 30 respondents, 4 people (13%) stated that the use of technology was very effective, while 21 people (70%) stated that the use of technology was effective. Only 5 people (17%) considered the use of technology to be less effective in understanding new concepts. These results indicate that the majority of respondents see that technology can be an effective tool in facilitating understanding of new concepts in learning. Thus, the use of technology in a learning context can be considered a valuable resource to support a more effective and results-oriented learning process.

Next question, Do you feel that learning with the Seamless Learning approach helps you apply the concepts learned in everyday life day? With the following answer options: Very helpful, Helpful, Not very helpful and Not helpful. With the following answer results:

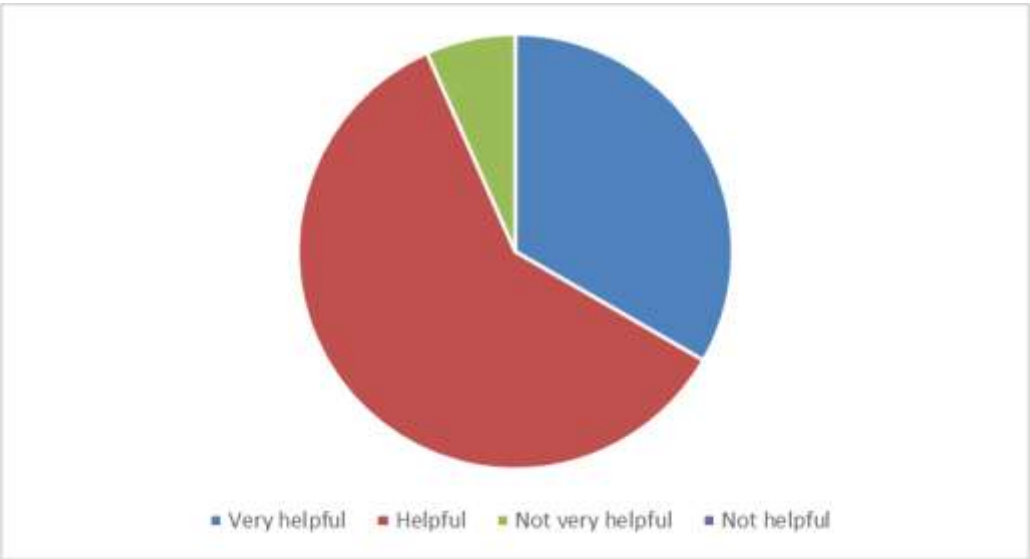

Figure 5. The Seamless Learning approach helps respondents apply the concepts learnt in everyday life

Based on the results of questionnaire analysis regarding perceptions of learning using the Seamless Learning approach in applying the concepts learned in everyday life, the majority of respondents stated that this learning provided significant assistance. Of the 30 respondents, 10 people (33%) stated that learning using the Seamless Learning approach was very helpful in applying these concepts in everyday life, while 18 people (60%) stated that this learning was helpful. Only 2 people (7%) stated that the learning was not helpful. These results show that the majority of respondents see that the Seamless Learning approach is able to connect learning concepts with real life contexts, thereby helping them apply the knowledge gained in everyday situations. This emphasizes the importance of implementing a relevant and integrated learning approach in preparing students to face challenges in the real world.

Final question, To what extent do you feel that learning with the Seamless Learning approach improves your overall learning achievement? With the following answer options: Very much improving, Increasing, Not very improving and Not improving. With the following answer results:

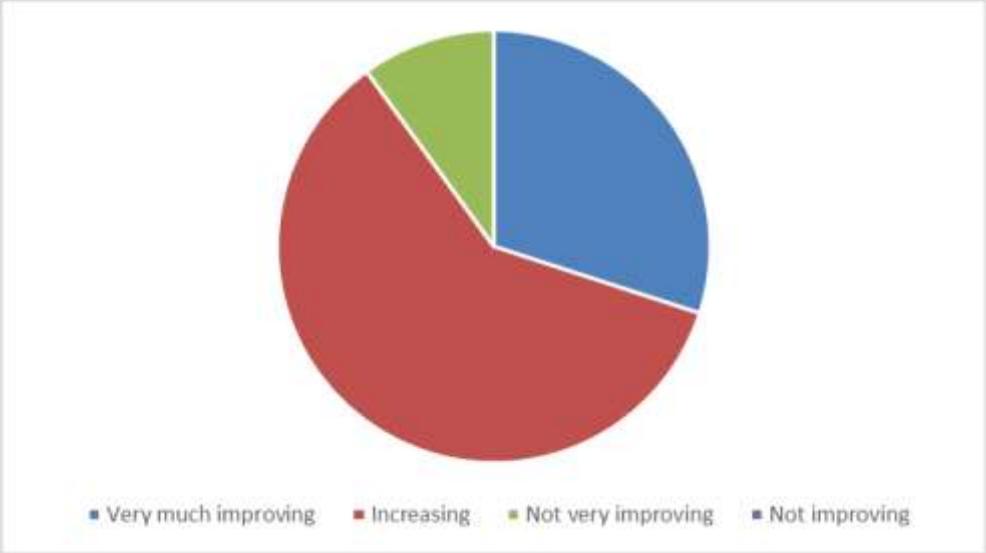

Figure 6. Learning by using the Seamless Learning approach improves students' overall learning achievement

Based on the results of the latest questionnaire analysis regarding perceptions of increasing learning achievement with the Seamless Learning approach, the majority of respondents stated that this approach contributed positively to increasing overall learning achievement. Of the 30 respondents, 9 people (30%) stated that learning using the Seamless Learning approach greatly improved their learning achievement, while 18 people (60%) stated that this learning improved their learning achievement. Only 3 people (10%) stated that this learning did not really improve their learning achievement. These results indicate that the majority of respondents see that the Seamless Learning approach has a positive impact in improving their overall learning achievement. This emphasizes the importance of implementing integrated and innovative learning strategies, such as Seamless Learning, in achieving broader educational goals and preparing students for success in the future.

CONCLUSION

Based on the results of the analysis of the six questionnaires conducted regarding the use of Seamless Learning in the learning context of elementary school children, it can be concluded that

the majority of respondents showed a positive perception of this approach. The majority of respondents use technology regularly in the classroom learning process and show a fairly active level of involvement in learning outside the classroom using technology. Apart from that, most respondents also felt that learning with the Seamless Learning approach made them more enthusiastic, effective in understanding new concepts, helped them apply these concepts in everyday life, and improved their overall learning achievement.

Thus, the results of the questionnaire show that the implementation of Seamless Learning has great potential to increase student engagement and learning achievement in elementary schools. However, it should be noted that some respondents also indicated that there is room for improvement in optimizing the effectiveness of using Seamless Learning. Therefore, this conclusion emphasizes the importance of continuing to develop and improve integrated and innovative learning strategies, such as Seamless Learning, to support the achievement of broader educational goals and ensure students' readiness to face the demands of the modern world.

AUTHORS' CONTRIBUTION

Look this example below:

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

Author 4: Formal analysis; Methodology; Writing - original draft.

Author 5: Supervision; Validation.

Author 6: Other contribution; Resources; Visuali-zation; Writing - original draft.

REFERENCES

A population-level analysis of associations between school music participation and academic achievement: Correction to Guhn, Emerson, and Gouzouasis (2019). (2020). *Journal of Educational Psychology*, *112*(2), 328–328. https://doi.org/10.1037/edu0000431

Aboagye, E., Yawson, J. A., & Appiah, K. N. (2020). COVID-19 and E-Learning: The Challenges of Students in Tertiary Institutions. *Social Education Research*, 1–8. https://doi.org/10.37256/ser.212021422

Alaloul, W. S., Liew, M. S., Zawawi, N. A. W. A., & Kennedy, I. B. (2020). Industrial Revolution 4.0 in the construction industry: Challenges and opportunities for stakeholders. *Ain Shams Engineering Journal*, *11*(1), 225–230. https://doi.org/10.1016/j.asej.2019.08.010

Ameen, N., Tarhini, A., Shah, M., & Madichie, N. O. (2021). Going with the flow: Smart shopping malls and omnichannel retailing. *Journal of Services Marketing*, *35*(3), 325–348. https://doi.org/10.1108/JSM-02-2020-0066

Asghar, M. Z., Afzaal, M. N., Iqbal, J., & Sadia, H. A. (2022). Analyzing an Appropriate Blend of Face-to-Face, Offline and Online Learning Approaches for the In-Service Vocational Teacher's Training Program. *International Journal of Environmental Research and Public Health*, *19*(17), 10668. https://doi.org/10.3390/ijerph191710668

Buentello-Montoya, D. A., Lomelí-Plascencia, M. G., & Medina-Herrera, L. M. (2021). The role of reality enhancing technologies in teaching and learning of mathematics. *Computers & Electrical Engineering*, *94*, 107287. https://doi.org/10.1016/j.compeleceng.2021.107287

Cahyadi, A., Hendryadi, Widyastuti, S., & Suryani. (2022). COVID-19, emergency remote teaching evaluation: The case of Indonesia. *Education and Information Technologies*, *27*(2), 2165–2179. https://doi.org/10.1007/s10639-021-10680-3

Chen, H.-R., Lin, W.-S., Hsu, T.-Y., Lin, T.-C., & Chen, N.-S. (2023). Applying Smart Glasses in Situated Exploration for Learning English in a National Science Museum. *IEEE*

Transactions on Learning Technologies, *16*(5), 820–830. https://doi.org/10.1109/TLT.2023.3276702

Chen, Z., Chia, A., & Bi, X. (2021). Promoting innovative learning in training and adult education – a Singapore Story. *Studies in Continuing Education*, *43*(2), 196–207. https://doi.org/10.1080/0158037X.2020.1772224

Childs, E., Mohammad, F., Stevens, L., Burbelo, H., Awoke, A., Rewkowski, N., & Manocha, D. (2024). An Overview of Enhancing Distance Learning Through Emerging Augmented and Virtual Reality Technologies. *IEEE Transactions on Visualization and Computer Graphics*, 1–15. https://doi.org/10.1109/TVCG.2023.3264577

Fahyuni, E. F., Wasis, W., Bandono, A., & Arifin, M. B. U. B. (2020). Integrating Islamic Values and Science for Millennial Students' Learning on Using Seamless Mobile Media. *Jurnal Pendidikan IPA Indonesia*, *9*(2), 231–240. https://doi.org/10.15294/jpii.v9i2.23209

French, R., Imms, W., & Mahat, M. (2020). Case studies on the transition from traditional classrooms to innovative learning environments: Emerging strategies for success. *Improving Schools*, *23*(2), 175–189. https://doi.org/10.1177/1365480219894408

Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). Parents' Experiences with Remote Education during COVID-19 School Closures. *American Journal of Qualitative Research*, *4*(3). https://doi.org/10.29333/ajqr/8471

Glahn, C., & Gruber, M. R. (2020). Designing for Context-Aware and Contextualized Learning. In S. Yu, M. Ally, & A. Tsinakos (Eds.), *Emerging Technologies and Pedagogies in the Curriculum* (pp. 21–40). Springer Singapore. https://doi.org/10.1007/978-981-15-0618-5_2

Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, *55*, 102183. https://doi.org/10.1016/j.ijinfomgt.2020.102183

Kuhail, M. A., ElSayary, A., Farooq, S., & Alghamdi, A. (2022). Exploring Immersive Learning Experiences: A Survey. *Informatics*, *9*(4), 75. https://doi.org/10.3390/informatics9040075

Lapitan, L. Ds., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Education for Chemical Engineers*, *35*, 116–131. https://doi.org/10.1016/j.ece.2021.01.012

Lichtenstein, M., & Rucks-Ahidiana, Z. (2023). Contextual Text Coding: A Mixed-methods Approach for Large-scale Textual Data. *Sociological Methods & Research*, *52*(2), 606–641. https://doi.org/10.1177/0049124120986191

Lubis, T., Arifin, Z., Febriani, S., Saputra, P., Mela, D. A., & Bedra, K. G. (2024). Tracking the Creativity of Autobiography and Biography Text Through Poster Media for Higher Education. *An Nabighoh*, *26*(1), 1–16. https://doi.org/10.32332/annabighoh.v26i1.1-16

Mahmud, M. E., Widat, F., & Fuadi, A. (2021). Learning Management System in Streamlining Learning through Seamless Learning Approach. *AL-ISHLAH: Jurnal Pendidikan*, *13*(2), 874–884. https://doi.org/10.35445/alishlah.v13i2.787

Olsen, J. K., Rummel, N., & Aleven, V. (2021). Designing for the co-Orchestration of Social Transitions between Individual, Small-Group and Whole-Class Learning in the Classroom. *International Journal of Artificial Intelligence in Education*, *31*(1), 24–56. https://doi.org/10.1007/s40593-020-00228-w

Parrish, S., Lavis, A., Potter, C. M., Ulijaszek, S., Nowicka, P., & Eli, K. (2022). How active can preschoolers be at home? Parents' and grandparents' perceptions of children's day-to-day activity, with implications for physical activity policy. *Social Science & Medicine*, *292*, 114557. https://doi.org/10.1016/j.socscimed.2021.114557

Popova, A., Evans, D. K., Breeding, M. E., & Arancibia, V. (2022). Teacher Professional Development around the World: The Gap between Evidence and Practice. *The World Bank Research Observer*, *37*(1), 107–136. https://doi.org/10.1093/wbro/lkab006

Qalati, S. A., Yuan, L. W., Khan, M. A. S., & Anwar, F. (2021). A mediated model on the adoption of social media and SMEs' performance in developing countries. *Technology in Society*, *64*, 101513. https://doi.org/10.1016/j.techsoc.2020.101513

Safiah, I., Degeng, I. N. S., Setyosari, P., & Ulfa, S. (2020). Design and development of seamless learning to improving learning outcome of Islamic economic course: A case study in Indonesia. *Journal of E-Learning and Knowledge Society*, 60-67 Pages. https://doi.org/10.20368/1971-8829/1135249

Sancar, R., Atal, D., & Deryakulu, D. (2021). A new framework for teachers' professional development. *Teaching and Teacher Education*, *101*, 103305. https://doi.org/10.1016/j.tate.2021.103305

Tariq, F., Khandaker, M. R. A., Wong, K.-K., Imran, M. A., Bennis, M., & Debbah, M. (2020). A Speculative Study on 6G. *IEEE Wireless Communications*, *27*(4), 118–125. https://doi.org/10.1109/MWC.001.1900488

Voon, X. P., Wong, L. H., Looi, C. K., & Chen, W. (2020). Constructivism-informed variation theory lesson designs in enriching and elevating science learning: Case studies of seamless learning design. *Journal of Research in Science Teaching*, *57*(10), 1531–1553. https://doi.org/10.1002/tea.21624

Yousef, A. M. F. (2021). Augmented reality assisted learning achievement, motivation, and creativity for children of low-grade in primary school. *Journal of Computer Assisted Learning*, *37*(4), 966–977. https://doi.org/10.1111/jcal.12536

Zhao, X., Li, X., Wang, J., & Shi, C. (2020). Augmented Reality (AR) Learning Application Based on the Perspective of Situational Learning: High Efficiency Study of Combination of Virtual and Real. *Psychology*, *11*(09), 1340–1348. https://doi.org/10.4236/psych.2020.119086