Ittishal Educational Research Journal
January 2025, Vol. 6, No. 01, p. 60 - 74
http://journal.ittishal.net/index.php/ierj
https://doi.org/ 10.51425/ierj.v6i1.74

EXPLORING COMMUNITY'S INTEREST IN DIGITAL COMPETITION-BASED PRODUCTS: A CASE STUDY ON INTERNATIONAL YOUNG RESEARCHER INNOVATION (IYRI)

Fajar Julian Santosa[1], Drajat Tri Kartono[2], Herlinda Nur Fitriana[3], Lutfi Andriani[4], Velda Fiska Saputri[5]
[1,2]Universitas Sebelas Maret, Indonesia
[3,4,5] Archana: Biro Psikologi, Riset, Training, dan Konsultan
Correspondence: fajarjuliansantosa@student.uns.ac.id, drajattri@staff.uns.ac.id, herlindaanf26@student.uns.ac.id, andriani.lutfi@student.uns.ac.id, veldafiska@gmail.com

ABSTRACT

The era of Industrial Revolution 4.0 has had a significant impact on the development of education, one of which is through the transformation of digital technology. This research aims to deepen understanding the education community's interest in digital competition-based products. This research is development research using the ADDIE Research and Development (R&D) method to develop online-based training and competition products. The data collection stage was carried out through a survey of 185 respondents. The data was then analyzed using the descriptive statistics method. The research results show that public interest in digital competition-based products is significant. Interest in digital competition-based products was demonstrated by 80% or 148 people interested in digital competition-based products. It was found that many respondents showed high interest in using digital competition-based products as interactive, flexible, and exciting learning tools.

***Keywords*:** digital education product; digital learning competition; community interest

INTRODUCTION

The Industrial Revolution 4.0 era has significantly impacted education development in Indonesia. Researchers from various countries have carried out research on digital education with competition on online platforms: ecology educational game in Italy (Sangiorgio et al., 2018), online programming competition (Serek et al., 2023), competition-based learning (CBL) in Taiwan (Chang & Lin, 2024), and online video competition model in Indonesia (Hidayati & Suryanto, 2021). However, studies regarding online competition with inquiry-based learning have not been carried out. This research is important because inquiry-based learning necessitates active participation and a student-focused approach, which can be challenging to execute online. Despite this, research is scarce exploring how to modify these strategies for online platforms, particularly in competitive contexts where students are driven to excel over their classmates. Investigating this area would provide insights into how the dynamics of online competition affect both the learning outcomes and the engagement levels of students employing inquiry-based techniques. Based on the background described, this research aims to deepen the understanding of the education community's interest in digital competition-based products with the case of International Young Researcher Innovation (IYRI).

In this era, activities to digitize learning are growing faster. The increasingly widespread growth of the internet has pushed digital learning to become increasingly exciting and popular. In school and digitalization, transformations could take shape as new knowledge and practices of teaching, learning, communicating, and organizing work in school (Pettersson, 2021). Innovative and interactive digital tools are replacing traditional education methods in this digital age. E-learning is one of the educational entities relevant to the fourth industrial revolution in education (Yuhasriati et al., 2020). Using the internet and digital technology as a sophisticated model has made it easier and faster for humans to interact with machines without borders (unlimited) and across borders. Education is experiencing a significant transformation with technology adoption, accelerating student learning processes and activities by strategically exploiting opportunities. One of the innovative learning activities for students is a digital-based creativity competition.

Digital competition-based products offer an innovative approach to education, providing interactive and engaging platforms for learning. As the interest in such products continues to grow within the education community, it becomes imperative to understand the factors driving this interest and the potential impact on learning outcomes. Understanding the education community's interest in digital competition-based products is crucial to enhance further the effectiveness and relevance of educational tools in the era of the Industrial Revolution 4.0. This study aims to delve deeper into the education community's interest in digital competition-based products. The study utilizes the ADDIE Research and Development method to develop online-based training and competition products to meet the growing demand for digital-based creativity competition.

A digital competition is a competition that uses digital platforms and technology as a forum to test participants' abilities, creativity, and knowledge. Slattery et al. (2023) highlight the value of innovative project-based learning activities with digital platform competition for supporting student learning through five themes: "collaboration," "opportunities for creativity," "immersive learning environment," "student engagement," and "technology and digital skills.". In contrast to conventional competitions that may be held physically, digital competitions usually occur in virtual spaces, utilizing the internet and digital technology for implementation. There are several advantages to digital-based competition innovation for students. First, technological developments open up new opportunities for delivering and receiving education. Fewella (2023) examined the most feasible strategies for teaching practical courses during or after a pandemic through distance learning (on online platforms) by holding competitions to boost students' motivation levels. Digital competitions utilize interactive platforms and technology to create more exciting learning experiences. This can arouse students' and teachers' interest in learning, creating a more dynamic and creative atmosphere. Second, digital competitions encourage healthy competition among participants. Digital platforms can enable learning conditions that are more inclusive and equitable for all students (Slattery et al., 2023). This effort can increase students' learning motivation because they are involved in

challenges that stimulate cognitive abilities, creativity, collaboration, and problem-solving.

International Young Researcher Innovation (IYRI) is a digital-based competition and training activity aimed at the younger generation, especially elementary and middle school students, dedicated to improving critical thinking and inquiry skills to carry out simple research/discoveries. IYRI has three areas of activity: (1) Research, (2) Bootcamp, and (3) Innovation Competition. IYRI adheres to the inquiry learning model, so it is hoped that all activities carried out by students are directed at seeking, discovering, and solving their problems (Gunardi, 2020; Prasetiyo & Rosy, 2020). Inquiry-based learning is an efficient learning method applied in many science courses; it is a research-oriented method that awakens the personal curiosity of learners (Çulha, 2022). Learners are motivated intrinsically, and they learn by research. In addition, the International Baccalaureate (IB) framework is based on the learning skills (ATL) approach. This approach is concept-based, transdisciplinary, and inquisitive, where students develop the confidence to take responsibility for their learning and become internationally minded individuals equipped to make a positive difference in their personal and global communities.

The literature on digital competition-based products in education highlights their effectiveness in promoting collaborative learning, enhancing student engagement, and fostering a deeper understanding of subject matter through active participation. Research has shown that these products not only cater to diverse learning styles but also provide real-time feedback and increased motivation for students to excel in their studies. Moreover, the integration of digital competition-based products into educational settings has the potential to bridge the gap between theoretical knowledge and practical application, as students actively apply their skills in competitive scenarios.

METHOD

This research used the Research and Development (R&D) method to develop online-based training and competition products. The R&D method applied is the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model, which aims to develop event products and test the event's effectiveness (Cahyadi,

2019). The ADDIE model in this study uses a mixed methods research strategy, where qualitative strategies are used for literature reviews and case studies to gain insight into its effectiveness in educational settings. Then, quantitative research strategies are applied to the evaluation phase to measure respondents' assessments of the attractiveness of the IYRI program. The International Young Researcher Innovation (IYRI) Bootcamp and Competition innovation product, which has gone through a development method, is then tested for the educational community to determine their interest in the IYRI Bootcamp and Competition digital-based competition product. The quantitative strategy was to collect survey data using an online questionnaire from all competition participants, 185 from more than 30 cities/districts in Indonesia. The participants then filled out a survey via a Google form that the researcher had prepared to determine participants' interest in digital competition-based products. The data was then analyzed using the descriptive statistics method. This research was conducted during October-November 2022.

RESULTS AND DISCUSSION

Respondent Characteristics

Webinar activities (science talks) are a means of introducing IYRI Bootcamp and Competition products to the educational community in Indonesia. In disseminating information about webinars (science talks), we utilize the database owned by the Perpuskita platform, then carry out email blasts and WhatsApp blasts. Dissemination of webinar information is also carried out via social media, WhatsApp groups and door to door. This webinar activity was attended by 185 participants from more than 30 cities/districts in Indonesia. These participants then became respondents by filling out a questionnaire that had been prepared by the researchers in this study.

This questionnaire includes 5 (five) questions regarding the applicant's identity, perceptions, interests, and reasons for interest in registering for digital competition-based products (IYRI Bootcamp and Competition). The purpose of this questionnaire is to determine registrants' interest in digital competition-based products through webinar activities.

Table 1. Respondent Profile

Profile	Total	Percentage
Teachers	118	64%
Parents	37	20%
Public	30	16%

Source: researcher documents

Based on the results of the data analysis, respondents have characteristics consisting of three categories: teachers, parents, and general. Based on Table 1, most respondents were teachers, 64% or 118 people. The general category is 20% or 37 people, while the smallest number is in the elderly category, 16% or 30 people. The teacher category with the highest percentage shows that this activity is most popular with teachers.

Table 2. Information Sources

Sources	Total	Percentage
Social media	33	17.8%
WhatsApp	124	67%
Friends or Family	17	9.2%
Perpuskita's Broadcast	9	4.9%
Others	2	1.1%

Source: researcher documents

Table 2 explains the primary sources of information obtained by Webinar participants (Science Talk). The results show that the information source from WhatsApp is the most effective in impacting participation in Webinar (Science Talk) activities. It cannot be denied that WhatsApp is a widely used information method by Indonesians. The platform most widely used in online learning is WhatsApp because it is the easiest and most practical to use for students, teachers, and parents (Anggreani, 2022). Data shows that the information source from WhatsApp contributed to 67% of 124 participants. Meanwhile, social media, such as Instagram, has been accessed by 17.8% or 33 respondents.

Furthermore, information accessed by respondents via friends/family was 9.2% or 17 people, and promotions via Perpuskita WhatsApp broadcasts were accessed by 4.9% or nine respondents. Perpuskita is a digital library platform developed by PT. Padi Indah Digital often uses the WhatsApp Broadcast feature to promote its products and activities. "Other" sources of information, including leaders, school principals, Dharma Wanita UNS, etc., were accessed by 1.1% or two respondents.

Perception of Digital Competition-based Products

This questionnaire aims to determine perceptions of IYRI Bootcamp and Competition. The webinar activity is hoped to increase participants' interest in registering for IYRI Bootcamp and Competition activities and increase access to the Perpuskita platform. The results of the quantitative data analysis at this stage are presented in Figure 1.

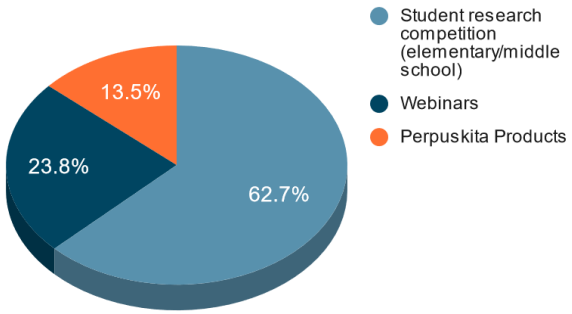

Figure 1. Respondents' Perceptions of IYRI Competition and Bootcamp Products

Based on the results of the data analysis that was carried out, participants' perceptions of IYRI digital competition-based products are divided into three categories, namely student research competitions (elementary/ middle schools), webinars, and library products. The student research competition was most frequently chosen by respondents, where 62.7% (116 respondents) perceived IYRI as a competition. Respondents who chose IYRI as a webinar event were 23.8% (44 people), while 13.5% (25 respondents) considered IYRI a Perpuskita product.

Interest in Digital Competition-based Products

The interest in digital competition-based products in the educational context reflects the paradigm shift in learning, which is increasingly adopting digital

technology. This product offers a dynamic and exciting learning approach, which can arouse interest and motivation in the educational community, including students, teachers, and parents.

Digital competition-based products offer flexibility in learning, allowing more comprehensive access for various society groups. In this way, learning is no longer limited by time and space constraints, thus enabling people to learn whenever and wherever they are. This allows individuals to independently develop their skills and knowledge while increasing inclusiveness in education.

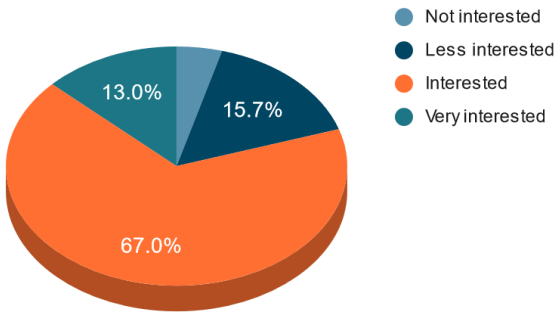

Figure 2. Education Community's Interest in IYRI Competition and Bootcamp Digital Competition-based Products

Based on the results of the data analysis that has been carried out, most webinar participants stated that they were interested in registering for IYRI Competition and Bootcamp activities, as many as 67% (124 people), while 13% (24 people) said they were very curious. Participants' interest in registering for IYRI was very high, although 15.7% of respondents said they were less interested. Very few respondents said they were not, only 4.3% (8 people). The educational community's interest in digital competition-based products reflects the need for innovative, engaging, and inclusive learning approaches. This product enriches the learning experience and opens up new opportunities to use digital technology to improve the overall quality of education. Embracing these technological advances is important for preparing students for the demands of the digital age and ensuring a successful future (Maryani et al., 2023).

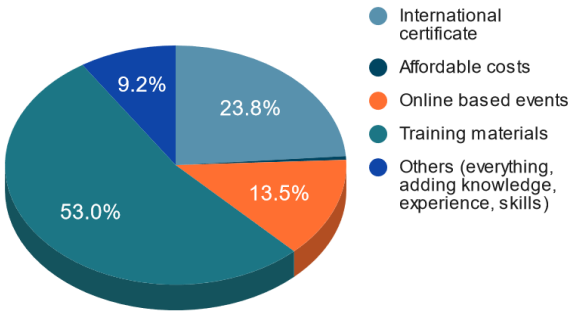

Figure 3. Reasons for Interest in Participating in IYRI Competition and Bootcamp

Based on the data obtained, the reasons for respondents' interest in participating in IYRI activities include training materials, international certificates, and online-based events. The data collection results showed that 53% (98 people) were interested in participating in IYRI activities because of the training material, 23.8% because of an international certificate, and 13.5% because the event was held online. The affordable cost category is only chosen by 1 (one) person with a percentage of 0.5%. Respondents who chose "Other" were 9.2% summarized into several answers, including all correct choices, increasing knowledge, experience, and skills. It can be concluded that people's interest in IYRI is influenced by the existence of training materials that they consider essential.

The study thoroughly analyzed the data collected from 185 respondents and found that digital competition-based products have garnered significant interest within the education community. This interest was demonstrated by 80% of the respondents, totaling 148 individuals, expressing interest in digital competition-based products. The findings reveal a strong inclination towards utilizing digital competition-based products as interactive, flexible, and stimulating learning tools. The survey results also underscore the potential impact of digital competition-based products on education in the era of the Industrial Revolution 4.0. The research has shed light on the fact that innovative and interactive digital tools are gradually supplanting traditional education methods, aligning with the goals of the digital age. The study has delved deeper into the factors driving the interest in digital competition-based products and their potential impact on learning outcomes.

The research results show that public interest in digital competition-based products in the educational context is quite significant. This indicates that there is great potential in the use of digital technology to improve the quality of learning. In the digital era, an adaptive and technology-oriented education management strategy is the key to improving the quality of education (Maryani et al., 2023). Steps that can be taken to improve the quality of education in the digital age include using digital technology in teaching and learning, managing human resources with a focus on the digital age, creating a curriculum that is relevant to technology, and putting in place learning models that are appropriate for the digital age.

The robust interest in digital competition-based products among the education community indicates a growing preference for innovative learning tools. Integrating digital competition-based products offers a dynamic and engaging approach to education, fostering interactive platforms where students can develop critical thinking, inquiry skills, and collaborative abilities. It was found that many of the research respondents showed a high interest in using digital competition-based products as interactive and engaging learning tools. In addition, factors such as technological skills (Prasanti et al., 2023), the need for experiential learning (Phang et al., 2022), and the intrinsic appeal of digital competitions (Felszeghy et al., 2019) are factors that influence people's interest in these products.

However, it should be noted that several challenges may be faced in implementing digital competition-based products in education. One of them is the difference in the accessibility and availability of technology in various regions and community groups. Obstacles to implementing online learning include limited use of devices and internet access. Restricted use of devices, for example, the lack of cellphones or computers among students, while limited use of the internet, namely the lack of a supporting network, is influenced by the different educational backgrounds of students' parents. This can trigger students' lack of interest in learning, which can market learning effectively (Rosnaeni & Prastowo, 2021). For those with limited access to digital devices or internet connectivity, digital competition-based products may not provide the same benefits. Therefore, when implementing such products, we must also consider gaps in access and make efforts

to ensure inclusivity in digital education. Implementing an inclusive digital learning model must combine parental assistance at home and distance assistance from teachers/mentors, friends, and professionals. This collaborative learning process is created so that each child can play and learn together with several learning participants (Kartono et al., 2022).

Apart from that, some people from the educational community have concerns about the use of technology in learning, including fears of excessive dependence on digital devices. Smartphones as digital devices are used in education and professional activities, provide a variety of entertainment, help with navigation, etc. However, studies show that excessive use of smartphones can be associated with negative emotional states and other psychological problems (Sheinov et al., 2023). In addition, it is essential to consider aspects such as parental involvement (Purwaningtyas et al., 2023) and integrating the IYRI product with the educational synchronizers currently used in learning (Subhash & Cudney, 2018). Parents must provide, monitor, and limit their children's access to electronic devices. The ubiquitous presence of technology in education has inspired a shift from traditional classroom lectures to integrated digital learning environments. By paying attention to these challenges, strategic steps can be taken to ensure that digital competition-based products can provide maximum benefits for education.

This study provides valuable insight into how the educational community responds to digital competition-based products. These findings provide a solid basis for further development in digital technology in academic contexts, hoping to increase students' motivation and learning outcomes and prepare them for the demands of an increasingly digital world.

CONCLUSIONS

Based on the research results on interest in the IYRI Competition and Bootcamp, it was found that many of the research respondents showed a high interest in using digital competition-based products as interactive and engaging learning tools. The research was carried out during Webinar (Science Talk) activities, with details of respondents being 63.9% teachers, 19.9% from the public, and 16.2% from the parent category. The results were that 67% (124 people) were interested in IYRI

Competition and Bootcamp products, 15.7% were less curious, and 13% of respondents said they were very interested. The research results show that public interest in digital competition-based products in the educational context is quite significant. However, it is necessary to pay attention to several challenges that may be faced in implementing digital competition-based products, namely the gap in access to technology among the community, which can hinder the equitable use of these products. Inquiry-based learning has significant potential benefits. Its implementation is not straightforward and requires careful planning and support to address these challenges effectively.

ACKNOWLEDGMENTS

We express our thanks and appreciation to ARCHANA Biro Psikologi, Riset, Training, dan Konsultan as the funder for this research. Partners, including PT, also support this research. Padi Indah Digital, PT. Tiga Serangkai Pustaka Mandiri, and ITTISHAL.

REFERENCES

Anggreani, C. (2022). Pembelajaran Daring pada Masa Pandemi Covid-19 di Pendidikan Anak Usia Dini. *EDUKATIF : JURNAL ILMU PENDIDIKAN*, *4*(2). https://doi.org/10.31004/edukatif.v4i2.2346

Cahyadi, R. A. H. (2019). Pengembangan Bahan Ajar Berbasis Addie Model. *Halaqa: Islamic Education Journal*, *3*(1). https://doi.org/10.21070/halaqa.v3i1.2124

Chang, H. T., & Lin, C. Y. (2024). Applying Competition-Based Learning to Stimulate Students' Practical and Competitive AI Ability in a Machine Learning Curriculum. *IEEE Transactions on Education*. https://doi.org/10.1109/TE.2024.3350535

Çulha, D. (2022). Gamification of Open Inquiry-based Learning of Blockchain Technologies. *U.Porto Journal of Engineering*, *8*(1), 12–22. https://doi.org/10.24840/2183-6493_008.001_0003

Felszeghy, S., Pasonen-Seppänen, S., Koskela, A., Nieminen, P., Härkönen, K., Paldanius, K. M. A., Gabbouj, S., Ketola, K., Hiltunen, M., Lundin, M., Haapaniemi, T., Sointu, E., Bauman, E. B., Gilbert, G. E., Morton, D., & Mahonen,

A. (2019). Using online game-based platforms to improve student performance and engagement in histology teaching. *BMC Medical Education*, *19*(1). https://doi.org/10.1186/s12909-019-1701-0

Fewella, L. N. (2023). Impact of COVID-19 on distance learning practical design courses. *International Journal of Technology and Design Education*, *33*, 1703–1726. https://doi.org/10.1007/s10798-023-09806-0

Gunardi. (2020). Inquiry Based Learning dapat Meningkatkan Hasil Belajar Siswa dalam Pelajaran Matematika. *SHEs: Conference Series 3*, *4*(1).

Hidayati, T., & Suryanto. (2021). Primary School Student Online Video Competition Model to Improve Six Steps Handwashing Ability to Prevent Upper Tract Infection. *Proceedings of the 4th International Conference on Sustainable Innovation 2020–Health Science and Nursing (ICoSIHSN 2020)*, *33*. https://doi.org/10.2991/ahsr.k.210115.020

Kartono, D. T., Akbar, R. D., Suryadinata, T. A., Soemanto, R., & Zuber, A. (2022). Inclusive school teacher's assistance strategy during the covid-19 crisis. *ICoSaPS*, 51–58. https://doi.org/https://doi.org/10.2991/978-2-494069-77-0_9

Maryani, L., Nur, J., Utami, S., Nurnaifah, I. I., & Farida. (2023). Strengthening School Management with Digital Education Technology to Improve the Quality of Educational Output. *Indonesian Journal of Educational Research and Review*, *6*(2). https://doi.org/10.23887/ijerr.v6i2.66039

Pettersson, F. (2021). Understanding digitalization and educational change in school by means of activity theory and the levels of learning concept. *Education and Information Technologies*, *26*, 187–204. https://doi.org/10.1007/s10639-020-10239-8

Phang, F. A., Pusppanathan, J., Nawi, N. D., & Che Harun, F. K. (2022). Drone Technology for Primary School Students in Learning STEM. *AIP Conference Proceedings*, *2542*. https://doi.org/10.1063/5.0103450

Prasanti, N., Sofiyanurriyanti, S., Hidjrawan, Y., Marlinda, M., Hartati, R., Kasmawati, K., Irmayani, I., Basuki, M., & Akmal, A. K. (2023). Pemanfaatan Media Pembelajaran Berbasis Teknologi Informasi dan Komunikasi di Sekolah Dasar.

ADMA : Jurnal Pengabdian Dan Pemberdayaan Masyarakat, *3*(2). https://doi.org/10.30812/adma.v3i2.2671

Prasetiyo, M. B., & Rosy, B. (2020). Model Pembelajaran Inkuiri Sebagai Strategi Mengembangkan Kemampuan Berpikir Kritis Siswa. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, *9*(1). https://doi.org/10.26740/jpap.v9n1.p109-120

Purwaningtyas, F. D., Septiana, Y., Aprilia, H., & Candra, G. (2023). Dampak penggunaan gadget terhadap perkembangan psikologi pada anak sekolah dasar. *Jurnal Psikologi Wijaya Putra (Psikowipa)*, *4*(1), 1–9. https://doi.org/10.38156/psikowipa.v4i1.84

Rosnaeni, R., & Prastowo, A. (2021). Kendala Implementasi Pembelajaran Daring di Sekolah Dasar Pada Masa Pandemi Covid -19 : Kasus di SDN 24 Macanang Kabupaten Bone. *Jurnal Basicedu*, *5*(4), 2241–2246. https://doi.org/10.31004/basicedu.v5i4.1151

Sangiorgio, F., Gjoni, V., Fiore, N., Tarantino, D., & Basset, A. (2018). An international online competition to stimulate student's interest on ecological issues. *SCIRES-IT - SCIentific RESearch and Information Technology*, *7*(2), 35–42. https://doi.org/10.2423/I22394303V7N2P35

Serek, A., Saimassay, G., Zhaparov, M., Nguyen Giang, C., Truong Hoang, V., & Zhalgassova, Z. (2023). Analysis of Self-esteem on Students' Performance in Online Programming Competition. *Proceedings - 2023 17th International Conference on Electronics Computer and Computation, ICECCO 2023*. https://doi.org/10.1109/ICECCO58239.2023.10147137

Sheinov, V. P., Nizovskikh, N. A., & Devitsyn, A. S. (2023). Problems from smartphone usage: relationships with emotional intelligence, self-confidence and conflict behavior in Belarus and Russia. *Sibirskiy Psikhologicheskiy Zhurnal*, *89*. https://doi.org/10.17223/17267080/89/5

Slattery, E. J., Butler, D., Michael, O., & Marshall, K. (2023). Primary School Students' Experiences using Minecraft Education during a National Project-Based Initiative: An Irish Study. *TechTrends*. https://doi.org/10.1007/s11528-023-00851-z

Slattery, E. J., Butler, D., O'Leary, M., & Marshall, K. (2023). Teachers' experiences of using Minecraft Education in primary school: An Irish perspective. *Irish Educational Studies*. https://doi.org/10.1080/03323315.2023.2185276

Subhash, S., & Cudney, E. A. (2018). Gamified learning in higher education: A systematic review of the literature. *Computers in Human Behavior*, *87*, 192–206. https://doi.org/10.1016/j.chb.2018.05.028

Yuhasriati, Jasmaniah, Azhari, B., Ma'awiyah, A., Zulkifli, Syabuddin, Hamid, M., Hamidansyah, Ridhwan, M., Hambali, Ilyas, & Bahri, S. (2020). E-Learning as Connector among Education Institution in the 4th Industrial Revolution. *1st Bukittinggi International Conference on Education*, 1–5. https://doi.org/10.1088/1742-6596/1471/1/012024