MAJALAH ILMIAH JOURNAL
LPPM Universitas Putra Indonesia YPTK Padang
Jl. Raya Lubuk Begalung, Padang, West Sumatera, Indonesia, Zip Code: 25221
Volume: 32, Issue: 1, Page: 42 - 49, 30/06/2025, e-ISSN: 1412-5854
Available online at website: https://jmi-upiyptk.org/ojs/index.php/jmi/index

Gamification-Based Joyful Learning: An Analysis of the Effectiveness of Using Zep Quiz

Endah Windarti[1], **Indarwati**[2], **Safinatus Sa'adah**[3], **Supriani**[4], **Arief Rahman Yusuf**[5]✉
[1,2.3,4,5] Pascasarjana, Pedagogi, Universitas Muhammadiyah Ponorogo, Ponorogo, 63471, Indonesia
yusuf@umpo.ac.id

Abstract

The rapid development of digital technology has made Generation Z inseparable from social media and gadgets, causing learning fatigue to become a common problem in educational environments. Low student engagement and intense interaction with technology can actually be an opportunity to use it as a learning tool that encourages motivation and improves learning outcomes. Joyful learning is presented as a solution to overcome this learning fatigue. One relevant approach is gamification, which can create a more engaging learning experience. This study aims to determine the impact of gamification, specifically through the Zep Quiz application, on student motivation and learning outcomes. The method used is a quasi-experimental design, which compares the learning outcomes of students who participate in gamified learning with those who do not. The results show that the application of gamification through Zep Quiz improves student learning outcomes. In addition, gamification has been proven to encourage motivation and engagement, as well as create a joyful learning atmosphere that strengthens material comprehension and knowledge retention. These findings support the theory that gamification is an effective strategy for improving the quality of the learning process.

Keywords: Gamifikasi, Joyful learning, Learning Outcomes, Zep Quiz, Digital Education

1. Introduction

The rapid development of digital technology has made Generation Z inseparable from social media and technology. Generation Z is highly dependent on the internet[1]. Technology has become a part of the lives of Generation Z [2]. Generation Z has been involved with technological advances since birth[3]. Social media users, including Gen Z, are increasingly familiar with it because it can fulfill many of their needs, such as information, entertainment, promotion, and building relationships with other netizens [4]. Many Generation Z spend time surfing the internet, such as the web and social media [5].

Many students easily get bored when studying. Learning fatigue is a problem often faced by students in a learning environment [6]. Repetitive or unchanging learning makes students bored and lose focus, which makes learning ineffective and difficult to achieve goals [7]. One of the problems that can arise during the learning process is fatigue, which can make it difficult [8]. For several reasons, including the process ininteresting or monotonous learning, as well as an uncomfortable learning environment and atmosphere, may cause students to feel bored with the lessons taught by their teachers [9].

Student boredom in learning and the intense interaction with gadgets that Generation Z engages in can be an opportunity for the use of technology in learning to increase student motivation and learning outcomes. The use of student learning media and their involvement[10]. Research results show that social media platforms such as Facebook, TikTok, Instagram, and YouTube can be used as learning media. Social media also helps learning by improving the quality of learning and making learning activities more effective [11].

Learning outcomes are an important indicator in evaluating the success of the learning process. Learning outcomes reflect changes in student behavior in terms of knowledge (cognitive), attitude (affective), and skills (psychomotor) after participating in a learning process [12], [13]. Learning outcomes reflect the extent to which students are able to achieve the basic competencies set out in the curriculum. In a study conducted by Learning outcomes are also influenced by various internal factors such as student motivation, interest, and self-

Accepted: 20-05-2025 | Revision: 01-06-2025 | Publication: 30-06-2025 | doi: 10.35134

confidence, as well as external factors such as learning methods, the role of teachers, and the learning environment[14].

The cognitive domain covers aspects of thinking such as remembering, understanding, and creating; the affective domain covers attitudes and values; and the psychomotor domain covers practice and motor skills. The integrative educational taxonomy integrative develops and connects these three domains and emphasizes the importance of balancing them to achieve optimal learning outcomes [15].

Motivation affects how hard students try to learn. It also affects their academic results. In this situation, teachers act as strategic directors, facilitators, and motivators for students. Research conducted by [16] found that the role of teachers is very important in fostering students' desire to learn, it was found that students experience a tendency to withdraw from learning activities due to a lack of motivation and selfconfidence. Research conducted by [17] found that students have a greater tendency to study independently when they have higher levels of motivation. This finding shows the importance of building intrinsic motivation that comes from within students rather that relying on external factors.

Joyful learning is here to overcome various problems of student boredom in learning so that if learning outcomes decline with previous learning methods, by using a joyful learning model, student learning outcomes can increase[18]. This approach not only increases learning motivation and student engagement, but also helps them understand and practice Islamic principles [19].

The application of gamification was initially used more in the field of marketing, before finally being widely applied in the field of education. This shift was based on the belief that gamification can be used to help students find a balance between achieving learning objectives and fulfilling their evolving learning needs. Simply put, gamification is understood as the use or application of game design elements in a non-game contex[20].

To effectively implement gamification, a sufficient understanding of the concept and its application is required the concept and its application, so that learning objectives and benefits can be achieved optimally. Gamification is the integration of game mechanics designed to enhance user engagement, enjoyment, and loyalty[21].

In the learning process, gamification is positioned as an approach that utilizes game elements to motivate students. The media used in this approach is also considered capable of capturing students' interest and inspiring them to continue to be involved in the learning process. Game-based learning is believed to create a more enjoyable learning atmosphere, while encouraging the involvement of all students regardless of status[22]

The application of gamification is one example of an effort to create enjoyable learning to improve learning outcomes. Students show greater interest and enthusiasm in learning activities and achieve improved academic results with the application of gamification in learning [23].

In an effort to improve learning outcomes, innovative learning approaches have become one solution. For example, the Problem Based Learning (PBL) approach has been proven to improve learning outcomes because it requires students to think critically, solve problems, and work together [24]. In addition, the use of interactive digital media can increase student engagement in the learning process, which in turn has a positive impact on learning outcomes. In the context of online learning, the use of interactive and collaborative learning applications also contributes significantly to improving student learning outcomes [25].

Junior High School 6 Ponorogo as adequate facilities in the field of information technology. Students are provided with tablets to support their learning. Against this background, the researcher will conduct research related to the use of gamification, namely Zep Quis, in order to realize joyful learning to improve student learning outcomes.

The rapid expansion of digital technology has shaped the learning behavior of Generation Z, whose daily activities are closely tied to gadgets and social media platforms. This condition, however, often leads to learning boredom when instructional methods remain monotonous and fail to engage students actively. Reduced motivation negatively affects students' achievement across cognitive, affective, and psychomotor domains. Hence, it is crucial for schools to adopt innovative learning approaches that correspond to the digital preferences of today's learners.

Joyful learning emerges as a relevant strategy to address learning fatigue by fostering meaningful, enjoyable, and participatory learning experiences. Gamification aligns with this principle by integrating game mechanics into educational contexts to increase motivation and sustain engagement among learners. Considering that SMP Negeri 6 Ponorogo provides digital learning facilities and student access to personal tablets, the use of the Zep Quiz application offers an opportunity to implement a game-based learning environment. Therefore, this study examines the effectiveness of Zep Quiz in improving students' motivation and learning outcomes.

Research Problem Statements

1. Does the implementation of gamification using the Zep Quiz application influence the learning outcomes of seventh-grade students at SMP Negeri 6 Ponorogo?
2. How does Zep Quiz affect students' motivation toward learning?
3. What are students' responses to the use of gamification as part of joyful learning?

Research Objectives

1. To analyze the effect of Zep Quiz on students' learning outcomes.
2. To investigate the contribution of Zep Quiz to students' motivation.
3. To explore students' perceptions of joyful learning through the use of Zep Quiz.

2. Methods

This study uses a quasi-experimental design (NonEquivalent Control Group Design) to assess the effect of gamification using the Zep Quiz application on student motivation and learning outcomes. The research subject consisted of two seventh-grade classes at Junior High School 6 Ponorogo, namely class VII-H as the experimental class that received learning with gamification and class VII-G as the control class that received learning without gamification.

The study involved 54 seventh-grade students from SMP Negeri 6 Ponorogo. The experimental group (Class VII-H) consisted of 28 students (15 female, 13 male), while the control group (Class VII-G) consisted of 26 students (14 female, 12 male). All students were provided with school-managed tablet devices connected to classroom internet services, enabling equal access to the Zep Quiz platform throughout the learning activities

The research instruments included learning outcome tests (pretest–posttest) and interview questions related to learning motivation. The research procedure included: (1) administering a pretest to both classes, (2) implementing learning with and without gamification, and (3) administering a posttest and motivation questionnaire. Data analysis was performed using descriptive statistics and a difference test (t-test) to compare the learning outcomes of the two classes.

3. Results and Discussions

Research quasi-experimental conducted at SMP Negeri 6 Ponorogo showed that the application of gamification through the Zep Quiz platform had a positive impact on student learning outcomes and motivation. Based on Table 1 of the student learning test results, the average score for the experimental class (VII-H) was 90.64, while the control class (VII-G) obtained an average of 83.07. Thus, there was a difference of 7.57 points, indicating that gamification-based learning was able to significantly improve academic performance compared to conventional learning.

Table 1. Student Learning Test Data

Class	Number Student	Average	Value >85	Value <80
VII G	26	83,03	60%	20%
VII H	28	90,64	85%	5%

The distribution of student scores also shows a striking difference between the two groups. In class VIIH, 85% of students achieved scores above 85, and only 5% scored below 80. In contrast, in class VII-G, only 60% of students scored above 85, while 20% scoredbelow 80. This data shows that the use of gamification not only increases the average score but also helps to reduce the gap in academic achievement between students.

In addition to quantitative results, qualitative data was obtained from interviews with three students in class VII-H. Respondent 1 stated that the interactive quiz format on Zep Quiz made learning feel more enjoyable and easier to memorize. This response is consistent with the increase in the average score of the experimental class. Respondent 2 revealed that the attractive visual display and appropriate level of difficulty of the questions reduced boredom and improved understanding of the material. Meanwhile, Respondent 3 highlighted that the ranking feature encouraged competitive motivation and triggered a desire to learn more material outside of class. Overall, the students responses showed that Zep Quiz succeeded in creating ajoyful learning atmosphere that increased engagement and motivation to learn.

The results of the study show that gamificationbased learning can significantly improve learning outcomes. The average difference of 7.57 points between the experimental class and the control class shows that game elements such as points, levels, challenges, and ranking systems play a role in increasing students' intrinsic motivation. This improvement is in line with gamification theory, which states that the integration of game mechanics can increase engagement, material retention, and learning satisfaction

Figure 1. Students using Zep Quiz in learning 5.

Discussion

Research results at SMPN 6 Ponorogo show that the application of gamification through Zepquiz improves student learning outcomes, with the average score for class VII-H (90.64) being 7.57 points higher than class VII-G (83.07), as well as receiving positive responses from students regarding engagement and motivation. These findings are in line with previous studies in the last five years, such as a study that found that gamification in science learning in secondary schools increased academic achievement by up to 8% compared to conventional methods, with elements such as points and leaderboards as the main drivers. However, this study is unique because it uses Zepquiz, which integrates an interactive quiz format similar to television games, which students found more engaging and helpful for material retention.

The more even distribution of scores in the experimental class also shows that gamification can help students with varying abilities achieve better academic performance. These findings reinforce the results of previous studies that reported gamification can improve academic achievement by up to 8% compared to conventional methods, especially through competitive elements and direct feedback. In addition, Zep Quiz has a unique feature in the form of an interactive quiz format that resembles a television game show, which has been proven to attract students' interest and accelerate the process of understanding the material, as reflected in the students' responses.

The findings of this study are in line with the study [26] showing that visual elements and the dynamics of challenges in gamification can reduce boredom and increase student focus. The results of this study also expand on the findings of [27] which states that gamification is more effective in certain subjects. This study shows that gamification is also effective in memorization-based material through repetitive and engaging quiz mechanisms [28].

In addition, the results of this study support the view [29] hat the effectiveness of gamification is highly dependent on the design of the platform used. In this context, the ranking feature, attractive color display, and proportional level of difficulty of questions in Zep Quiz have been proven to increase students' intrinsic motivation, encouraging them to engage more deeply during and outside of class hours.

The results indicate that the application of Zep Quiz significantly enhances learning outcomes, as evidenced by the 7.57-point mean score difference between the experimental and control classes. This improvement occurs because gamification elements such as points, ranking, time-based challenges, and immediate feedback stimulate intrinsic motivation, encouraging students to study more actively and consistently. This psychological engagement fosters deeper cognitive processing and better knowledge retention.

Functionally, Zep Quiz enhances engagement through its visual interface, real-time scoring, and proportional question levels that reduce boredom and help students concentrate for longer periods. Competitive ranking further stimulates students' desire to perform better, transforming evaluation activities into entertaining learning experiences.

In comparison with previous studies, which concluded that gamification increases academic achievement and classroom participation, this research offers distinct findings due to its use of a television game–style quiz format. Students reported that this format was more enjoyable and memorable than conventional quiz applications, helping them internalize content more quickly and with greater enthusiasm

3. Conclusions

This research confirms that gamification through the Zep Quiz application effectively improves student learning outcomes while creating a joyful learning environment in junior secondary education. The quantitative results demonstrate a substantial improvement in academic achievement, as seen in the higher average score of the experimental group and the greater proportion of students achieving scores above 85. These findings suggest that game-based learning fosters not only academic success but also equitable learning outcomes across diverse student ability levels.

The qualitative evidence further reinforces the positive impact of Zep Quiz. Students reported that interactive quiz features encouraged them to participate actively, compete fairly, and concentrate more effectively during lessons. Visual displays, real-time feedback, and a television-style game format helped students retain information longer and understand materials more independently. These results indicate that gamification stimulates intrinsic motivation, which plays a significant role in improving concentration, engagement, and academic performance. Hence, Zep

Quiz supports not only cognitive development but also socio-emotional engagement in learning.

Overall, this study highlights the strong potential of gamification as an innovative instructional strategy in responding to the learning characteristics of Generation Z. Since today's learners prefer interactive, visual, and technology-driven tasks, Zep Quiz offers an effective solution to minimize learning boredom and support competency achievement. Therefore, the integration of gamification should be expanded across subjects that require content mastery, repetition, and evaluation. Schools and teachers are encouraged to adopt gamified learning designs to create sustainable joyful learning environments that meet the evolving demands of digital-era education.

Recommendations and Future Use of Zep Quiz

1. Teachers need training in designing gamified assessments to ensure Zep Quiz supports competency mastery rather than competition alone.

2. The application may be adopted across other subjects requiring memorization and conceptual reinforcement (e.g., Science, Social Studies, and Language learning).

3. Future research should explore adaptive features within Zep Quiz, including automated difficulty adjustment, reward–project integration, and long-term motivation tracking.

Acknowledgements

This research was completed thanks to the support of various parties. The researchers would like to thank the teachers and staff of SMPN 6 Ponorogo for their assistance during the implementation of gamification through Zep Quiz, as well as the seventh-grade students who participated enthusiastically and provided constructive feedback. Appreciation is also given to family, friends, and colleagues for their moral support, motivation, and technical assistance. May this research be useful for the development of more interactive and enjoyable learning.

References

[1] Y. Kristyowati and Mt. Sekolah Tinggi Theologi Indonesia Manado, "GENERASI 'Z' DAN STRATEGI MELAYANINYA," *AMBASSADORS: Jurnal Teologi dan Pendidikan Kristiani*, vol. 2, no. 1, pp. 23–34, Jun. 2021, doi: 10.31219/osf.io/w3d7s.

[2] C. Solichah, "MEMPERSIAPKAN GENERASI Z YANG BERKARAKTER DAN BIJAKSANA DALAM PENGGUNAAN TEKNOLOGI MELALUI PENDIDIKAN," *Jurnal Citra Pendidikan Anak*, vol. 3, no. 3, 2024, doi: 10.38048/jcpa.v3i3.3729.

[3] L. Y. Hastini, L. Chairoel, and M. E. Yan Fitri, "Analisis Peranan Literasi Teknologi dan Informasi Sebagai Variabel Moderating Dalam Hubungan Openness To Expereience, Conscientiousness, Agreeableness, Serta Neuroticism Dengan Perencanaan Karier Pada Generasi Z di Universitas Dharma Andalas," *Majalah Ilmiah UNIKOM*, vol. 19, no. 2, 2021, doi: 10.34010/miu.v19i2.6385.

[4] C. Nismeta Rotua Mendrofa and N. Aprilia, "Pemanfaatan Media Sosial oleh Generasi Z sebagai Media Pembelajaran (Utilization of Social Media By Generation Z As A Learning Medium)," *Jurnal Tonggak Pendidikan Dasar : Jurnal Kajian Teori dan Hasil Pendidikan Dasar*, vol. 2, no. 1, 2023, doi: 10.22437/jtpd.v2i1.22874.

[5] K. Sikumbang *et al.*, "Peranan Media Sosial Instagram terhadap Interaksi Sosial dan Etika pada Generasi Z," *Journal on Education*, vol. 6, no. 2, 2024, doi: 10.31004/joe.v6i2.4888.

[6] W. U. Tanjung and D. Namora, "Kreativitas Guru dalam Mengelola Kelas untuk Mengatasi Kejenuhan Belajar Siswa di Madrasah Aliyah Negeri," *Jurnal Pendidikan Agama Islam Al-Thariqah*, vol. 7, no. 1, 2022, doi: 10.25299/al-thariqah.2022.vol7(1).9796.

[7] A. Rahmatika, A. A. Manurung, and F. Ramadhani, "Pengembangan Media Pembelajaran Berbasis Augmented Reality untuk Meningkatkan Empati Anak Usia Dini dengan Metode MDLC (Multimedia Development Life Cycle)," *sudo Jurnal Teknik Informatika*, vol. 2, no. 3, 2023, doi: 10.56211/sudo.v2i3.330.

[8] R. A. Syafitri, S. Azmi, and S. P. Lubis, "Kejenuhan belajar: dampak dan pencegahan," *Jurnal Generasi Tarbiyah : Jurnal Pendidikan Islam*, vol. 1, no. 2, 2022.

[9] M. Disman and A. Rudin, "FAKTOR-FAKTOR PENYEBAB KEJENUHAN BELAJAR SISWA PADA MATA PELAJARAN BAHASA INGGRIS," *Jurnal Ilmiah Bening : Belajar Bimbingan dan Konseling*, vol. 5, no. 2, 2020, doi: 10.36709/bening.v5i2.13356.

[10] F. Hakeu, I. I. Pakaya, and M. Tangkudung, "Pemanfaatan Media

Pembelajaran Berbasis Gamifikasi dalam Proses Pembelajaran di MIS Terpadu Al-Azhfar," *Awwaliyah: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, vol. 6, no. 2, 2023, doi: 10.58518/awwaliyah.v6i2.1930.

[11] C. Ayu Aprilia, S. I. Wahyuni, and W. N. Sari, "Pemanfaatan Media Sosial Oleh Generasi Z Sebagai Media Pembelajaran Era Post Pandemi," *PESHUM : Jurnal Pendidikan, Sosial dan Humaniora*, vol. 2, no. 3, 2023, doi: 10.56799/peshum.v2i3.1797.

[12] A. Rahman Yusuf, E. Sutadji, M. Sugandi, and H. Elmunsyah, "Vocational Learning in Industry as a Work Readiness Strategy of Industrial Era 4.0: Model of Path Analysis," *International Journal of Innovation, Creativity and Change. www.ijicc.net*, vol. 14, no. 7, p. 2020, Accessed: Nov. 17, 2025. [Online]. Available: www.ijicc.net

[13] A. Rahman Yusuf and P. Graduate Student, "Implementation of Online STEM-PjBL through Various Learning Platforms in Vocational High Schools during Covid-19 Pandemic," *Elementary Education Online*, vol. 20, no. 2, pp. 1–8, 2021, doi: 10.17051/ilkonline.2021.02.04.

[14] A. R. Yusuf, Marji, E. Sutadji, and M. Sugandi, "Integration of STEM Project-Based Learning into 21st Century Learning and Innovation Skills (4Cs) in Vocational Education Using SEM Model Analysis," *Hacettepe Egitim Dergisi*, vol. 38, no. 4, 2023, doi: 10.16986/HUJE.2023.499.

[15] M. A. Alafnan, "Enhancing educational outcomes using AlAfnan taxonomy: integrating cognitive, affective, and psychomotor domains," *International Journal of Evaluation and Research in Education (IJERE)*, vol. 14, no. 3, pp. 2419–2437, Jun. 2025, doi: 10.11591/IJERE.V14I3.33147.

[16] Y. Yumriani, M. Maemunah, S. Samsuriadi, M. A. Tapa, and B. Burbakir, "Peran Guru dalam Meningkatkan Motivasi dan Prestasi Belajar Siswa Sekolah Dasar," *Pedagogik Journal of Islamic Elementary School*, 2022, doi: 10.24256/pijies.v5i1.2434.

[17] N. Fauziah, T. Sobari, and E. Supriatna, "HUBUNGAN MOTIVASI BELAJAR DENGAN KEMANDIRIAN BELAJAR SISWA SMPN 6 GARUT," *FOKUS : Kajian Bimbingan dan Konseling dalam Pendidikan*, vol. 4, no. 1, pp. 49–55, Jan. 2021, doi: 10.22460/FOKUS.V4I1.5951.

[18] M. Nurfalaq, N. Wahyuni, M. M. Prasetyo, Sitti Wirda, and N. Nurhidayah, "Penerapan Model Pembelajaran Menyenangkan (Joyfull Learning) dalam Meningkatkan Hasil Belajar IPA," *Jurnal Biotek*, vol. 10, no. 1, 2022, doi: 10.24252/jb.v10i1.29297.

[19] M. B. Mahmudi, A. Arief, and Rehani, "Strategi Joyful Learning dalam Meningkatkan Motivasi, Keterlibatan dan Pemahaman Konsep Peserta Didik Pada Pembelajaran Pendidikan Agama Islam," *QOSIM : Jurnal Pendidikan Sosial & Humaniora*, vol. 3, no. 1, pp. 96–103, Feb. 2025, doi: 10.61104/JQ.V3I1.662.

[20] M. A. Shaliha and M. R. Fakhzikril, "Pengembangan Konsep Belajar dengan Gamifikasi," *Inovasi Kurikulum*, vol. 19, no. 1, 2022, doi: 10.17509/jik.v19i1.43608.

[21] Hendriyati Haryani, S. M. Wahid, A. Fitriani, and M. faris Ariq, "Analisa Peluang Penerapan Teknologi Blockchain dan Gamifikasi pada Pendidikan," *Jurnal MENTARI: Manajemen, Pendidikan dan Teknologi Informasi*, vol. 1, no. 2, 2023, doi: 10.34306/mentari.v1i2.250.

[22] S. Srimuliyani, "Menggunakan Teknik Gamifikasi untuk Meningkatkan Pembelajaran dan Keterlibatan Siswa di Kelas," *EDUCARE: Jurnal Pendidikan dan Kesehatan*, vol. 1, no. 1, 2023, doi: 10.70437/jedu.v1i1.2.

[23] K. binti Hambali, J. Nazir Cawangan Miri Maimun Aqsha Lubis, and P. Pembentukan Pendidikan Lanjutan dan Profesional, "KEPENTINGAN GAMIFIKASI DALAM PENGAJARAN DAN PEMUDAHCARAAN (PDPC) PENDIDIKAN ISLAM," *ASEAN COMPARATIVE EDUCATION RESEARCH JOURNAL ON ISLAM AND CIVILIZATION (ACER-J). eISSN2600-769X*, vol. 5, no. 1, 2022.

[24] U. M. Mataram, F. Zakiya, N. Rachma, and V. Rezania, "Analisis Dampak Pembelajaran Daring Terhadap Interaksi Sosial Siswa Sekolah Dasar Negeri di Kecamatan Sukodono," *Seminar Nasional Paedagoria*, vol. 2, no. 0, pp. 67–74, Aug. 2022, Accessed: Nov. 16, 2025. [Online]. Available:

https://journal.ummat.ac.id/index.php/fkip/article/view/10044

[25] A. Pangestu, M. F. Fatah, A. Untsa, and S. Lailiyah, "Efektivitas Penggunaan Media Youtube dan Quiziz dalam Meningkatkan Motivasi Belajar Siswa Madrasah Ibtidaiyah," *Jurnal Basicedu*, vol. 6, no. 5, 2022, doi: 10.31004/basicedu.v6i5.3952.

[26] D. Dicheva, C. Dichev, L. Cassel, B. Guy, and K. Irwin, "Exploring the Impact of Non-conventional Gamification Elements on Student Motivation and Engagement," in *Proceedings - Frontiers in Education Conference, FIE*, 2021. doi: 10.1109/FIE49875.2021.9637199.

[27] M. Sailer, J. U. Hense, S. K. Mayr, and H. Mandl, "How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction," *Comput Human Behav*, vol. 69, pp. 371–380, Apr. 2017, doi: 10.1016/J.CHB.2016.12.033.

[28] A. Domínguez, J. Saenz-De-Navarrete, L. De-Marcos, L. Fernández-Sanz, C. Pagés, and J. J. Martínez-Herráiz, "Gamifying learning experiences: Practical implications and outcomes," *Comput Educ*, vol. 63, pp. 380–392, Apr. 2013, doi: 10.1016/J.COMPEDU.2012.12.020.

[29] S. Deterding, D. Dixon, R. Khaled, and L. Nacke, "From game design elements to gamefulness: Defining 'gamification,'" *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, MindTrek 2011*, pp. 9–15, 2011, doi: 10.1145/2181037.2181040;PAGEGROUP:STRING:PUBLICATION.

B ors (10 PT)

Endah Windarti was born on November 18, 1995, in Ponorogo, East Java. She is a student in the Pedagogy Study Program at the Muhammadiyah University of Ponorogo. She currently works as a teacher at one of the schools in Ponorogo. Her dedication to the field of education encourages her to continually develop her professional skills and contribute to improving the quality of learning. She resides in Ponorogo, East Java, and can be contacted via email: endahwindarti@gmail.com

Indarwati was born on October 20, 1999, in Ponorogo, East Java. She is a student in the Pedagogy Study Program at the Muhammadiyah University of Ponorogo. Currently, she works as a teacher at one of the schools in Ponorogo. Her interest in the field of education motivates her to continuously develop her professional competencies and contribute to improving the quality of learning. She resides in Ponorogo, East Java, and can be contacted via email: indarwati18312111@gmail.com.

Safinatus Sa'dah was born on October 05, 1995, in Ponorogo, East Java. She is currently a student in Pedagogy Study Program at the Muhammadiyah University of Ponorogo and work as a teacher in one of the local shools. Her strong interest in the field of education motivates her to continuously expand her knowledge and improve her professional competence. She resides in Ponorogo, East Java and can be contacted via email: safinatuss7@gmail.com

	**Supriani** was born in Ponorogo, East Java, on June 12, 1986. She is a vocational high school teacher in Ponorogo and a Master's student in pedagogy at Muhammadiyah University of Ponorogo. Her interests include developing effective and innovative learning experiences and improving the quality of education. Can be contacted via email: anniekemuning1986@gmail.com
	**Arief Rahman Yusuf** was born on May 2, 1989, in Malang, East Java**.** He holds a Doctoral degree in Vocational Education. He currently serves as a lecturer in the Pedagogy Study Program at the Postgraduate Program of Universitas Muhammadiyah Ponorogo His academic interests are centered on the application of information technology in education, artificial intelligence in educational settings, and the development of Internet of Things (IoT)-based learning systems. Through his research and teaching, he is committed to advancing innovative and technology-driven educational practices that enhance learning effectiveness and pedagogical quality can be reached via email at yusuf@umpo.ac.id.