Indonesian Journal of Community Engagement
Jurnal Pengabdian kepada Masyarakat
Vol. 9, No. 1, March 2023, Page. 46-52
DOI: http://doi.org/10.22146/jpkm.70237

Kahoot and Quizizz Training for Science Teachers in the Online Learning Evaluation Process to Improve Teachers' Mastery of Technology

Febblina Daryanes*, Irda Sayuti
Study Program of Biology Education, Faculty of Teacher Training and Education, Universitas Riau, Pekanbaru, Indonesia

Submitted: October 05th 2021; Revised: January 10th 2023; Accepted: February 24th 2023

Keywords:
Kahoot
Learning evaluation
Online learning
Quizizz
Training

Abstract Teachers play a role in planning, implementing, and evaluating the learning process. During online learning, teachers must be able to design online learning that is effective, efficient, innovative, and interesting. Based on interviews with teachers who are members of the Science MGMP SMP in Pekanbaru, information was obtained that the majority of teachers still have difficulty evaluating online learning. According to students carrying out evaluations through WhatsApp groups makes them less motivated. This service activity aims to improve teachers' mastery of technology in using the Kahoot and Quizizz applications as an evaluation system during online learning and fostering creative and innovative attitudes. The method in community service activities is through training and technical guidance which is carried out through face-to-face and online mentoring. Participants were given a pretest and posttest questions to see the achievement of material content and were given assignments. It is known that the average pretest score of the trainees is 61.58, and the posttest value of the participants is 91.58. Seen an increase in the value of participants with N-Gain of 0.77, which indicates an increase in the value of participants in the high category. The quality of the outputs of the tasks collected by the participants was also very good. It can be concluded that the service participants have been able to create interactive quizzes based on Kahoot and Quizizz and are able to apply them in the learning process.

1. INTRODUCTION

The COVID-19 pandemic that has hit the whole world has certainly affected all sectors of life. The health, economic, socio-cultural and education sectors are affected. The education sector is one of the biggest sectors that need attention in the current situation. Since the outbreak of the COVID-19 case in Indonesia in March 2020, the Indonesian government issued regulations for physical distancing or keeping a distance and the face-to-face learning process switched to online/network learning. This makes all lines try to adapt to the new policy. The role of technology and information is crucial, mastery of technology for teachers as educators is an absolute thing. Technological advances that are so rapid in the era of the Industrial Revolution 4.0 make teachers have to be able to explore it in order to realize effective and efficient learning in a network. Teacher professionalism is a challenge when facing learning demands during this pandemic condition, because these demands reflect an increasingly complex need that comes from students, not only the teacher's ability to master lessons but also other abilities that are psychological, strategic and productive. Such demands can only be answered by professional teachers.

The teacher plays a role in planning, implementing, and evaluating the learning process. During online learning, teachers must be able to design online learning that is effective, efficient, innovative, and interesting. This becomes a big challenge for a teacher because it takes skill in using technology. A teacher must master qualified digital

ISSN 2460-9447 (print), ISSN 2541-5883 (online)
*Corresponding author: Febblina Daryanes
Study Program of Biology Education, Faculty of Teacher Training and Education, Universitas Riau, Jl. Muchtar Lutfi, Simpang Baru, Pekanbaru 28292, Indonesia
Email: febblina.daryanes@lecturer.unri.ac.id

literacy to be able to deal with online learning situations during a pandemic. Currently, there are many applications on the internet that are available and can be used by teachers to carry out the learning process to carry out effective remote evaluations with an application like Kahoot, Quizizz, and Google Forms.

The learning process needs to be evaluated to see students' understanding of the concepts of learning materials that have been taught. During the online learning process, there were quite a lot of complaints from teachers because of the difficulties in conducting an evaluation system. This was obtained based on the results of interviews with science teachers during the implementation of the Science Subject Teacher Consultation. Online-based interactive quizzes can be used to review and measure student achievement of online learning materials. Interactive Quiz is a quiz application that allows students to use responsive buttons to show answer choices for each question given. According to Arsyad (2011) interactive quizzes are classified as computer-based learning media because making interactive quizzes cannot be done without the help of a computer. Meanwhile, according to Sari & Yarza (2021), interactive quizzes are a combination of several learning methods, both lectures, discussions and questions and answers that are packaged in the form of an interesting game.

Kahoot and Quizizz is one of the many applications available on the internet as an interactive quiz application that can be used by teachers for an effective, efficient, innovative and interesting evaluation process. Kahoot is a gamification application to see students' abilities through questions, in the form of an online platform for conducting multiple choice tests. Kahoot can be used in the learning process as an evaluation tool including pretest, posttest, practice questions, material strengthening, remedial and enrichment (Guardia et al., 2019; Hadi et al., 2020). Based on research conducted by Daryanes & Ririen (2020), that the Kahoot application is very effective as an evaluation tool in terms of motivation and attention. The Quizizz application is a web tool for creating educational-based interactive games in which there are several icons to be developed, one of which is the quiz icon. In addition, the Quizizz application can also be used for surveys, discussions, and assignments (Kristanti et al., 2021). Kahoot and Quizizz applications can be accessed via smartphones or laptops (Eddy & Dafitri, 2021).

The advantages of the Quizizz and Kahoot applications in the evaluation process include the direct evaluation results being neatly organized, this makes the assessment process more efficient and practical. In addition, this application provides freedom for the teacher to be able to set the time limit for each question so that the teacher can adjust the processing time according to the difficulty level of each question. This application presents questions with a new, more exciting atmosphere equipped with music, color variants and attractive images so that the psychology of children who follow the evaluation process are more relaxed (Aswir et al., 2020; Daryanes & Ririen, 2020). The evaluation through Kahoot and Quizizz is carried out simultaneously so as to reduce student cheating, especially in the Quizizz application, each question and answer option can be arranged randomly between one student and another. And also the ranking and acquisition of student scores can be directly seen and recapitulated by the system. According to Nugroho et al. (2019) through the Kahoot and Quizizz applications, students play an active and enthusiastic role in participating in the evaluation process.

Aswir et al. (2020) conducted Kahoot and Quizizz training for Elementary School Lab School FIP UMJ teachers, the results of the training were able to fulfill the implementation of digital assessments and assist in the online learning evaluation process. In addition, Nizaruddin & Nugraha (2020) have also conducted training on the use of Quizizz as an online learning evaluation medium for teachers in Semarang, the result of the training is that teachers are able to use Quizizz in the evaluation process. The Quizizz application training was also conducted by Sari & Yarza (2021), where the participants' responses showed that elementary school teachers in Jakarta were very enthusiastic because they gained knowledge and skills in using the Quizizz application. This is in line with the training conducted by Kristanti et al. (2021) for junior high school teachers in Kafemenanu that the teachers were very enthusiastic about the training carried out and after being tested on students, all students felt happy because it looked attractive and the results were immediate. can be known by students. From the training that has been carried out, it can be seen that the Kahoot and Quizizz applications are quite easy to learn and use by teachers, these applications provide convenience for teachers and increase student motivation and teachers feel happy to gain insight and additional knowledge about mastering technology in the context of online evaluation.

Based on interviews with science subject teachers who are members of the Science MGMP SMP in Pekanbaru, information was obtained that the majority of science teachers still have difficulty evaluating online learning due to many factors including the high level of student cheating because it cannot be controlled directly as in the case of online learning. Face-to-face learning exams, besides that there are still many teachers who provide evaluation questions only through the whatsapp group and the collection of test results is through the whatsapp group, this of course makes the test results less well organized and many teachers complain that their cellphone memory is often full due to the large number of incoming files. This shows that it is less efficient in the implementation of online learning evaluations. There are still many teachers who do not maximize information technology in the evaluation process so that the online evaluation process tends to be monotonous and less interactive. The teachers said many students were bored with the evaluation system carried out by the teacher and they were less enthusiastic in answering exam questions or daily tests if they always only used whatsapp groups. This is supported by the results of research by Fitrah & Ruslan (2020) that in online learning

evaluations, teachers are constrained by their abilities and skills in using the technology chosen as the evaluation media so that evaluation activities are carried out as they are and are not in accordance with evaluation principles in general.

Based on the results of interviews with students, according to students carrying out evaluations through whatsapp groups makes them less motivated. They tend to feel that giving exam questions through WhatsApp groups is like giving assignments, not like carrying out evaluations, so students are less enthusiastic about taking online evaluations. Research by Idrus (2022) says that students' problems during online evaluations are the lack of utilization and knowledge of technology.

Based on these problems, the service team felt the need for training activities to strengthen mastery of technology in the evaluation of science teachers in Pekanbaru City during online learning as a solution to existing problems. Kahoot and Quizizz are applications that will be trained for teachers so that teachers are expected to be able to design interactive quizzes in the evaluation process and make the evaluation process during online learning more effective and efficient which ultimately leads to improving the quality of learning. According to Meryansumayeka et al. (2018), interactive quizzes can provide direct feedback on the results of student answers. Teachers can more freely manage time and technical in the implementation of the quiz through this interactive quiz. This makes students more challenged and enthusiastic in taking a test. Through interactive quizzes arranged in such a way, it will be effective and efficient in training students' abilities. Interactive quizzes really help students in understanding basic concepts on an ongoing basis.

The purpose of this training activity is to improve the technological mastery of Pekanbaru City Middle School science teachers in using the Kahoot and Quizizz applications as an evaluation system during online learning and to foster creative and innovative attitudes among teachers in Pekanbaru City in making interactive quizzes. The benefits of this training are for participants to increase the knowledge and competence of teachers in carrying out interactive evaluations during online learning and increase the potential of teachers in managing online classes to achieve effective and efficient online learning.

2. METHOD

This service activity was attended by 19 science teachers at the Pekanbaru City Middle School. Service activities were carried out in Pekanbaru on September 16, 2021. This activity consisted of three steps of activities, namely:

1. Preparation
   At this stage communication, observation and initial surveys were carried out on problems in the field. This activity was carried out by the service team, namely 3 lecturers from the biology education study program to interview science teachers who were members of the subject teacher deliberations regarding the problems faced during online learning. It was carried out during the implementation of the science subject teacher deliberation activities.
2. Implementation
   This stage carried out service activities where problems arise based on the results of observations and initial communication in the form of training in making interactive quizzes using the Kahoot and Quizizz applications. This activity was carried out by the service team (consisting of 3 biology education lecturers from FKIP UNRI and assisted by 3 students), to improve the technological mastery of science teachers in carrying out online evaluations. The target of this community service activity is science teachers who are members of the science subject teacher deliberations. This activity was attended by 19 junior high school science teachers in Pekanbaru city.
3. Evaluation
   At this stage an evaluation and reflection is carried out on the service activities carried out.

This activity done by the service team aims to see the achievement of the process and measure the increase in the ability to master technology and information through the creation of interactive quizzes for service participants. As for problem solving techniques, namely the problems found were resolved through training activities and technical guidance to teachers which were carried out through face-to-face and online mentoring. The face-to-face meeting begins by first being given pretest questions which aim to determine the teachers' prior knowledge in mastering technology related to making interactive quizzes through the Kahoot and Quizizz applications, then giving workshops related to interactive quiz making materials through the Kahoot and Quizizz applications after which they are given assignments. Furthermore, intense online guidance will be carried out in terms of working on the given task, after that posttest questions will be given to see the level of achievement of the material provided. After that, collecting and checking the assignments given as the responsibility for the training and interactive quizzes through the Kahoot and Quizizz applications.

To measure the achievement of the objectives of the training activities carried out, namely increasing the ability and skills in mastering technology regarding Kahoot and Quizizz, an evaluation instrument in the form of a test sheet is used as a pretest and posttest. In addition, by looking at the quantity and quality of bills or outputs produced as a measure to assess the increase in participants' understanding of the material for making learning videos and interactive quizzes. In addition, the evaluation carried out was to see the activeness of the activity participants in participating in a series of activities.

3. RESULT AND DISCUSSION

3.1 Preparation

The implementation of interactive quiz making training through the Kahoot and Quizizz applications is one solution

to the existing problems to improve teachers' mastery of technology and information during online learning (in the network). Teachers will be equipped with knowledge to design creative and innovative learning as well as effective and efficient in helping the teacher's work itself. Utilizing technological advances is something that must be done in the current era of the Industrial Revolution 4.0, but not all teachers are able to maximize their mastery of technology so special attention and training are needed to address this. One of them is through community service activities with the title "Training the Use of Kahoot and Quizizz Applications for Teachers in Improving Mastery of Technology and Information in the Online Learning Evaluation Process" which can improve the quality of teachers in facing the challenges of this era (Figure 1).

Before the training started, the event was opened by the head of the service, after that the service team did a pretest by distributing some questions related to the material about the Kahoot and Quizizz applications. This pretest activity aims to determine the initial knowledge level of the trainees in understanding the material for making interactive quizzes through the Kahoot and Quizizz applications. The pretest was conducted by utilizing the Kahoot and Quizizz applications, which are interactive quiz applications, at the same time introducing the trainees to one example of interactive quizzes that can be used in learning activities so that participants get direct experience in using interactive quizzes. The Kahoot application can increase the motivation and attention of the participants in participating in the learning evaluation (Daryanes & Ririen, 2020).

Figure 1 . Material presentation

3.2 Implementation

The core activity is training on making interactive quizzes through the Kahoot and Quizizz applications as an effort to increase teachers' mastery of information technology in dealing with online learning. The service team delivered several points related to making interactive quizzes which consisted of 1) introduction to Kahoot and Quizizz, 2) How to create Kahoot and Quizizz accounts, and 3) How to use Kahoot and Quizizz applications as teachers and students. After that, participants were assisted in creating Kahoot and Quizizz accounts (Figure 2).

During the activity, the service team was active as a facilitator and companion in the activity. During the activity, the participants were very enthusiastic about participating in the training activity because many teachers had never used the Kahoot and Quizizz applications in learning. Teachers feel happy in learning the Kahoot and Quizizz applications because these applications are very helpful for teachers in carrying out effective, efficient and innovative evaluations.

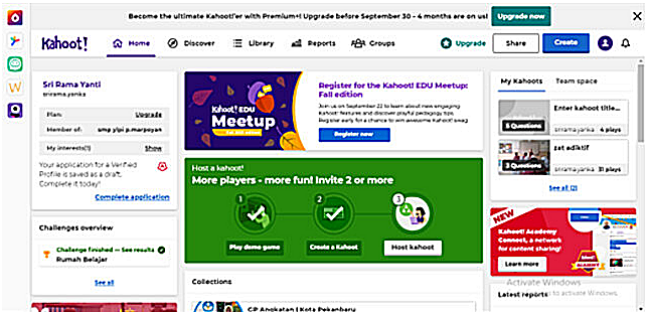

Figure 2 . Kahoot and Quizizz applications that have been made by the teacher

3.3 Evaluation

At the end of the activity, a posttest related to interactive quiz material was carried out through the Kahoot and Quizizz applications. The posttest activity was carried out aimed at seeing the extent of participants' understanding and mastery of the material that had been given and to find out feedback from participants after the training so that the service team could follow up again during online guidance. Then each participant was given the task of implementing an interactive quiz using the Kahoot and Quizizz applications in learning (Figure 3). As agreed, assignments are collected through google classroom created by the service team.

Figure 3 . The hands-on practice of the trainees in making interactive quizzes based on the Kahoot and Quizizz applications

During the work of the task, technical guidance is carried out online. The participants first joined through the Whatsapp Group and intensely carried out mentoring with the service team in completing the assigned tasks. Then the service team reviews the tasks and provides suggestions for improvement so that revisions can be made according to the suggestions from the service team and then return them to send improvements from their tasks.

Based on the results of the initial questionnaire distributed by the service team to determine the knowledge of the training participants about Kahoot and Quizizz, information was obtained that 84% of participants knew the advantages of IT-based assessments and understood the convenience offered when using IT-based assessments but very few participants knew about the Kahoot and Quizizz applications. Quizizz as an IT-based assessment that can be used as an assessment in the learning process. The data from the initial questionnaire are presented in Table 1.

Based on Table 2, it can be seen that the average pretest score of participants before participating in training activities is 61.58 and for the average posttest value of participants after participating in training activities is 91.58. There was an increase in the value of the participants after participating in the training activities.

Based on the results of statistical tests, it was found that Asymp. Sig. (2-tailed) is 0.000, because the value is 0.000 < 0.05, it can be concluded that there is a difference between the results of the pretest and posttest evaluations, this indicates that there is an effect of training activities on making Kahoot and Quizizz on the results of the pretest and posttest of the trainees. The increase in the value of the participants after participating in the training activities can be seen from the N-Gain value between the pretest and posttest scores of the trainees.

Based on the results of N-Gain 0.77, it shows that the increase in the value of participants after attending the training is in the high category. This shows that there is a significant increase in the achievement of the results of the evaluation of participants' knowledge after participating in the training on the use of the Kahoot and Quizizz applications. In addition, after the participants took part in the training, it was seen that the participants had succeeded in creating Kahoot and Quizizz accounts, making questions related to their respective subject matter and applying Kahoot and Quizizz in the learning process. This can be seen from the proof of assignments that have

Table 1 . Results of participants' initial questionnaire

No	Question Items	Percentage of participants who answered correctly
1	Online assessment	63%
2	IT-based assessment with the concept of playing while learning	63%
3	Advantages of IT-based assessment	84%
4	Evaluation software with different devices	21%
5	The advantages of the Quizizz app over Kahoot	26%
6	Website address for Kahoot account	53%
7	Types of questions in the Kahoot application	47%
8	Advantages of Kahoot and Quizizz	42%
9	Weaknesses of Kahoot and Quizizz	57%
10	Scoring on Kahoot	60%

Table 2 . Pretest and posttest results of training participants

No	Initials of Participant's Name	Pretest	Posttest
1	A	60	100
2	AD	90	100
3	D	50	100
4	HM	50	80
5	DA	50	90
6	EM	80	100
7	S	50	80
8	MRM	50	100
9	MN	40	100
10	MI	100	100
11	NFD	90	90
12	NO	70	90
13	N	40	80
14	RH	70	90
15	SA	50	80
16	SRY	60	100
17	S	60	100
18	TF	50	80
19	YG	60	90
	Average	**61.58**	**91.58**
	N-gain	**0.77**	**N-gain Category=High**

been sent by the participants. The assignments that have been sent by the participants have been very good. Participants were able to explore the features in the Kahoot and Quizizz applications. The participants said that the students were very happy when taking the quiz using the Kahoot and Quizizz applications. This is in accordance with what was stated by Wang & Lieberoth (2016) that Kahoot is a student activating tool, according to Barrio et al. (2015); Licorish et al. (2018); Siegle (2016), that educational games increase student motivation. And it was also easier for the participants to get the results of the quizzes that had been done because the Kahoot and Quizizz applications had immediately recaptured the scores of each student. Even teachers who initially did not know about Kahoot and Quizizz applications after their training often used Kahoot and Quizizz applications in learning. As stated by Sari & Yarza (2021) and Aswir et al. (2020), that the Kahoot and Quizizz training provided positive things for teachers in increasing knowledge and skills. According to Ekowati et al. (2020), that this Kahoot training is very necessary because many teachers do not know it. Currently, the learning process is digital-based, so it is important to use technology to be able to adapt to the times (Ririen & Daryanes, 2022).

4. CONCLUSION

Based on the results of community service activities through training in making interactive quizzes using the Kahoot and Quizizz applications for teachers, it can be concluded that:

1. Participants are able to create interactive quizzes using the Kahoot and Quizizz applications and are able to apply them in the learning process.
2. The results of the analysis of the pretest-posttest values showed an increase in the high category, namely the average pretest value of 61.58 to 91.58 in the posttest average value with an N-gain value of 0.77 which was in the high category. This shows an increase in participants' knowledge of technology mastery regarding Kahoot and Quizizz as an evaluation of online learning.
3. The quality of the output of the tasks sent by the participants is very good and is in accordance with the bill given. This shows an increase in the participants' skills in mastering technology using Kahoot and Quizizz as evaluations of online learning.

It is hoped that after this activity participants can disseminate their technological mastery skills related to interactive quizzes obtained from the training to other teachers in their schools. The role and support of the principal is needed to motivate teachers in developing technological capabilities that can be utilized in the learning process to improve the quality of learning. Based on the results achieved in this training activity, it is also recommended to conduct further training related to the implementation of interactive quizzes with other applications so that teachers can vary the evaluation process carried out in learning.

ACKNOWLEDGEMENT

We thank the Faculty of Teacher Training and Education, Universitas Riau, which has funded this community service activity through DIPA PNBP BLU Universitas Riau. In addition, we also thank the MGMP IPA Pekanbaru City for participating in this event.

CONFLICT OF INTERESTS

There is no conflict of interest occurred related to this publication. The manuscript submitted is our original work that has not been published elsewhere nor is being considered in other journal publications. The authors confirm that the manuscript has been read and approved by all named authors and that are no persons who satisfied the criteria for authorship but are not listed. All authors have been notified and approved of the corresponding author as the only contact regarding the manuscript's submission, revision, and approval processes.

REFERENCES

Arsyad, A. (2011). *Media pembelajaran*. PT Raja Grafindo Persada.

Aswir, A., Farihen, F., Gunadi, R. A. A., Wathoni, M., Zaitun, Z., Mujtaba, I., & Maulyadi, M. (2020). Pelatihan digital assessment berbasis Kahoot dan Quizizz untuk guru-guru Sekolah Dasar Lab School FIP UMJ. *Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ*, 1–9. https://jurnal.umj.ac.id/index.php/semnaskat/article/view/9171

Barrio, C. M., Organero, M. M., & Soriano, J. S. (2015). Can gamification improve the benefits of student response systems in learning? An experimental study. *IEEE Transactions on Emerging Topics in Computing, 4*(3), 429–438. https://doi.org/10.1109/TETC.2015.2497459

Daryanes, F., & Ririen, D. (2020). Efektivitas penggunaan aplikasi Kahoot sebagai alat evaluasi pada mahasiswa. *Journal of Natural Science and Integration, 3*(2), 172–186. https://doi.org/10.24014/jnsi.v3i2.9283

Eddy, Usman, A., & Dafitri, H. (2021). Pelatihan penggunaan aplikasi Quizizz sebagai alternatif media evaluasi pembelajaran jarak jauh. *TUNAS: Jurnal Ilmiah Pengabdian Kepada Masyarakat, 2*(2), 55–61. https://doi.org/http://dx.doi.org/10.30645/.v1i1.

Ekowati, S. H., Widyastuti, W. T., & Purbarini, A. (2020). Implementasi Kahoot dalam pembelajaran bahasa Prancis pada masa pandemi COVID-19 di SMK DKI Jakarta. *Dinamisia: Jurnal Pengabdian Kepada Masyarakat, 4*(4), 723–729. https://doi.org/10.31849/dinamisia.v4i4.4621

Fitrah, M., & Ruslan, R. (2020). Eksplorasi sistem pelaksanaan evaluasi pembelajaran di sekolah pada masa pandemi COVID-19 di Bima. *Jurnal Basicedu, 5*(1), 178–187. https://doi.org/10.31004/basicedu.v5i1.639

Guardia, J. J., Del Olmo, J. L., Roa, I., & Berlanga, V. (2019). Innovation in the teaching-learning process: The case of Kahoot!. *On the Horizon, 27*(1), 35–45. https://doi.org/10.1108/OTH-11-2018-0035

Hadi, F., Syafi'i, A., & Isgandi, Y. (2020). Pelatihan penerapan pembelajaran daring interaktif bagi guru-guru SD Al Islam Morowudi, Gresik. *To Maega: Jurnal Pengabdian Masyarakat, 3*(2), 142. https://doi.org/10.35914/tomaega.v3i2.420

Idrus, S. W. A. (2022). Analisis problematika evaluasi pembelajaran IPA pada masa pandemi: Kajian literatur. *Jurnal Ilmiah Profesi Pendidikan, 7*(3c), 1979–1983. https://doi.org/10.29303/jipp.v7i3c.880

Kristanti, E., Kharisma, G. I., & Sari, N. P. (2021). Pelatihan penyusunan soal berbasis mobile learning sebagai upaya menghadapi era pendidikan 4.0. *Jurnal Widya Laksana, 1*(1), 59–65.

Licorish, S. A., Owen, H. E., Daniel, B., & George, J. L. (2018). Students' perception of Kahoot!'s influence on teaching and learning. *Research and Practice in Technology Enhanced Learning, 13*(9), 1–23. https://doi.org/10.1186/s41039-018-0078-8

Meryansumayeka., Virgiawan, M. D., & Marlini, S. (2018). Pengembangan kuis interaktif berbasis e-learning dengan menggunakan aplikasi Wondershare Quiz Creator pada mata kuliah belajar dan pembelajaran matematika. *Journal Pendidikan Matematika, 12*(1), 29–42.

Nizaruddin, M., & Nugraha, A. E. P. (2020). Pelatihan pembuatan media untuk pembelajaran jarak jauh. *Jurnal Abdimas Bina Bangsa, 1*(1), 98–106. https://doi.org/10.46306/jabb.v1i1.19

Nugroho, D. Y., Situmorang, K., Tahulending, P. S., A, M. M. Y., & Rumerung, C. L. (2019). Pemanfaatan teknologi dalam pendidikan: Penggunaan fitur gamifikasi daring di SMA-SMK Kristen PENABUR Bandar Lampung. *Prosiding Konferensi Nasional Pengabdian Kepada Masyarakat Dan Corporate Social Responsibility (PKM-CSR), 2*, 869–877. https://doi.org/10.37695/pkmcsr.v2i0.394

Ririen, D., & Daryanes, F. (2022). Analisis literasi digital mahasiswa. *Research and Development Journal of Education, 8*(1), 210. https://doi.org/10.30998/rdje.v8i1.11738

Sari, P. M., & Yarza, H. N. (2021). Pelatihan penggunaan aplikasi Quizizz dan Wordwall pada pembelajaran IPA bagi guru-guru SDIT Al-Kahfi. *SELAPARANG Jurnal Pengabdian, 4*, 195–199. http://journal.ummat.ac.id/index.php/jpmb/article/view/4112

Siegle, D. (2016). Learning can be fun and games. *Gifted Child Today, 38*(3), 192–197. https://doi.org/10.1177/1076217515583744.

Wang, A. I., & Lieberoth, A. (2016). The effect of points and audio on concentration, engagement, enjoyment, learning, motivation and classroom dynamics using Kahoot!. *In Proceedings from the 10th European Conference on Games Based Learning*, 738.