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## Implementation of Game-Based Learning in Socialization to Teachers and Students as an Effort to Transform Digital Education

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### Abstract

*This community service activity is driven by the importance of adapting learning methods in line with technological developments and the needs and conditions of students and teachers. The purpose of this community service activity is to provide socialization on the benefits of implementing game-based learning methods by utilizing digital platforms in the modern education era. This activity involved 90 participants consisting of 45 teachers and 45 students of SMAN 1 Kefamenanu, North Central Timor, East Nusa Tenggara. The activity was carried out in September 2025. Before socialization, a pre-test was administered, followed by a post-test and questionnaire distribution to get participants' feedbacks. The results of the implementation of this socialization activity showed that there was a change in the increase in teacher and student understanding reaching 20% about gamification-based learning and its benefits in increasing learning motivation. However, in supporting the implementation of gamification-based learning, good cooperation is needed between teachers and school administrators in providing the necessary supporting facilities for the learning process.*

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### Abstrak

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**Pembelajaran Berbasis  
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Kegiatan sosialisasi ini dilatarbelakangi oleh pentingnya adaptasi metode pembelajaran sesuai dengan perkembangan teknologi dan kebutuhan serta kondisi peserta didik dan guru. Tujuan kegiatan pengabdian Masyarakat ini adalah untuk memberikan sosialisasi tentang manfaat implementasi metode pembelajaran berbasis game dengan memanfaatkan platform digital dalam era pendidikan modern. Kegiatan ini melibatkan 90 peserta yang terdiri 45 guru dan 45 siswa SMAN 1 Kefamenanu, Timor Tengah Utara, Nusa Tenggara Timur. Kegiatan dilaksanakan di bulan September 2025. Untuk mendapatkan data sosialisasi, team melaksanakan pretest and post-test, serta penyebaran angket untuk mendapatkan umpan balik dari peserta kegiatan. Hasil dari pelaksanaan kegiatan sosialisasi ini menunjukkan bahwa adanya perubahan peningkatan pemahaman guru dan siswa mencapai 20% tentang pembelajaran berbasis gamifikasi serta manfaatnya dalam peningkatan motivasi belajar. Namun dalam mendukung implementasi pembelajaran berbasis gamifikasi tersebut, diperlukan Kerjasama yang baik antara guru dan pengelola sekolah dalam menyediakan sarana pendukung proses pembelajaran yang dibutuhkan.

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## 1. INTRODUCTION

The development of digital technology has brought significant changes to various aspects of human life, including education. Digital transformation encourages educational institutions to adapt their learning systems, methods, and strategies to meet the needs of the times. Since the launch of the "Merdeka Belajar" (Freedom to Learn) policy by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia, it has become increasingly clear that innovation in learning is an absolute necessity. One innovation currently being widely discussed is the implementation of Game-Based Learning (GBL), a game-based learning approach that is not only fun but also emphasizes achieving instructional objectives.

Although the concept of digital learning has been around for quite some time, the reality on the ground shows that many teachers and students are still unable to fully utilize technology for teaching and learning activities. Most teachers are still fixated on conventional methods, such as lectures or giving written assignments, which often make students less active and tend to be passive in participating in learning. On the other hand, students nowadays live in a digital era filled with technological interactions, including the use of gadgets, social media, and online game applications. This gap between the learning styles of the digital native generation and the teaching approaches of the digital immigrant generation creates a major challenge in the Indonesian education sector.

The urgency of this community service is further strengthened by the phenomenon of low student learning motivation and low literacy in some school communities. Research conducted by Ramadhan et al (2025) shows that numeracy and literacy skill among students in Kefamenanu still needs improvement. Observations in several secondary schools also indicate that students are more interested in spending time playing games outside of class than participating in formal learning processes in the classroom. This shows that we need to connect students' interest in digital games with formal learning. One of the most useful methods is Game-Based Learning, which uses game mechanics, game dynamics, and game aesthetics to help people learn.

A current phenomenon in the Indonesian education community is the low digital literacy of teachers in utilizing technology to improve the quality of learning. According to a UNESCO report (2022), the digital literacy level of teachers in developing countries, including Indonesia, remains relatively low. Many teachers only use technology for administrative purposes or communication, rather than as a transformative pedagogical tool. Kurniawan et al. (2021) found that 63% of secondary

school teachers in Indonesia still have trouble using game-based digital applications for learning. This finding supported the data reported by UNESCO.

Furthermore, interviews with several teachers from some schools in Kefamenanu, Timur Tengah Regency, East Nusa Tenggara revealed that they perceive games as merely entertainment and have little impact on learning outcomes. This is because they do not have proper training on how to use digital platforms as tools for interactive learning. This view has made Game-Based Learning less effective, even though students are very excited about using game-based technology. In other words, there is a difference between what students need and what teachers are willing to do to make digital-based learning fun and useful.

The importance of this community service is further heightened by the global challenge of developing 21st-century skills, such as critical thinking, creativity, collaboration, and communication (the 4Cs) as also found on the study conducted by Thornhill-Miller, et al. (2023). If teachers do not immediately adopt innovative learning strategies such as Game-Based Learning, the risk of a competency gap between Indonesian school graduates and the demands of the global market will increase. Therefore, outreach activities on the application of Game-Based Learning are urgently needed to help teachers and students understand and implement learning that is more relevant to the digital era.

Globally, game-based learning has become a major trend in educational innovation. Shaffer et al. (2005) stated that the use of games in learning can increase student engagement and improve understanding of abstract concepts. Plass, Homer, and Kinzer (2015) also found that game-based learning can boost students' intrinsic motivation through rewards, challenges, and structured interactions.

Numerous studies in Indonesia corroborate the efficacy of this approach. Mulyati's (2020) research found that using Game-Based Learning such Quizizz in Math class helped students understand the material 35% better than traditional methods. A subsequent study conducted by Yulianti (2025) validated that the utilization of Clash of Champions as a Game-Based Learning model enhanced student motivation in learning Mathematics. Tampubolon (2025) also found out that the use of game-based learning such as Kahoot! in class can improve students' engagement, motivation and learning outcomes. Another study conducted by Fahada and Tampubolon (2022) also shows that game-based learning strategy can improve student performance on vocabulary achievement in English class. Furthermore, Nazli et al (2023) found that game-based learning such as Chinese Whisper can improve students' listening skill. The selection of media also plays a very important role in teaching such audio-based media that can help students concentrate better while learning as study shown by Tampubolon and Tamba (2022). Even though the research shows that Game-Based Learning (GBL) works, it is still not used much in schools. This is mostly because teachers do not fully know enough about technology or how to teach it.

From a theoretical perspective, the Game-Based Learning approach aligns with Vygotsky's (1978) constructivism theory, which emphasizes the importance of social interaction and active involvement in the learning process. Games facilitate students' exploration, collaboration, and the construction of knowledge in a more profound manner. Additionally, Self-Determination Theory (Deci & Ryan, 2000) posits that student learning motivation can be augmented by fostering autonomy, competence, and relatedness, which are frequently observed in gaming environments.

Previous literature shows that game-based learning has been proven effective in improving student motivation and learning outcomes. However, most studies focus solely on classroom implementation as part of academic experiments, rather than research-based community service activities. This article presents novelties in two main aspects: **1. Research-based socialization:** This community service program not only provides technical training to teachers and students, but also uses a research-based approach to identify field needs, implementation barriers, and effective adoption strategies. **2. Teacher-student collaboration:** While GBL has previously been studied primarily from the student perspective, this community service program emphasizes teacher

involvement as the primary facilitator, while also integrating students as the learning subjects. Thus, this community service program presents a collaborative model that can serve as a reference for other schools in adopting GBL.

With this novelty, this community service article is hoped to provide a practical contribution to the field of education and an academic enhancement to the literature concerning the digital transformation of education in Indonesia.

Based on the background, current phenomena, and literature review presented, the objectives of this community service activity are:

1. To disseminate the concept and practice of Game-Based Learning to teachers and students so they understand its potential and benefits in improving the quality of learning.
2. To improve teachers' digital literacy by providing practical training on how to design, implement, and evaluate game-based learning.
3. To increase student motivation and engagement in the learning process through the use of game media that is educational, fun, and relevant to the digital world they encounter daily.
4. To produce a research-based dissemination model that can be replicated in other schools as part of the digital education transformation effort in Indonesia.

## 2. METHODS

Teachers and students were the main participants in the socialization activities that took place at SMAN 1 Kefamenanu in North Timor Tengah Regency, East Nusa Tenggara. The participants were teachers of general subjects like math, science, social studies, language, and other subjects who need ways to make learning more interactive and representatives of SMAN 1 Kefamenanu and students who know how to use digital devices but have not used them to their full potential for learning yet. The total number of participants on this community service activity was 90 people, consisting of 45 teachers and 45 students. This community service activity was conducted within one week, September 12<sup>th</sup> until September 19<sup>th</sup> 2025.

The choice of locations and participants was based on early observations that showed that digital technology was still only being used for administrative tasks in these schools, while traditional methods were still the main way students learned.

This community service activity applied two stages of activity; **preparation and implementation**. On preparation stage, the team conducted needs identification which is initial observations and interviews were conducted with school officials to determine teachers' and students' understanding of Game-Based Learning and the challenges they face. Followed by designing a socialization module. On this stage the community service team developed a module covering the basic concepts of Game-Based Learning, application examples (Kahoot, Quizizz, Wordwall, etc.), and technical implementation steps. The last stage on preparation was coordination with partner schools. Intensive communication with school principals and teachers was conducted to determine the schedule, location, and technical implementation. The implementation stage itself was divided into three main sessions:

### 1. Socialization Session

On this session, the community service team presented material on the concept of Game-Based Learning, the underlying pedagogical principles, and its benefits in increasing student motivation and engagement. A brief literature review provided a scientific basis for the proven effectiveness of Game-Based Learning (GBL) in various learning contexts.

### 2. Discussion Session

The community service team opened a discussion session which allowed teachers and students to ask questions related to the presented materials. They were also encouraged to create free accounts and try out Game-Based Learning applications such as Kahoot.

### 3. Simulation Session

The community service team practised game-based learning using Kahoot! directly with teachers and students. After the simulation, the community service team provided feedback form to get teachers and students' view points on their experiences using the GBL method.

### 3. RESULT AND DISCUSSION

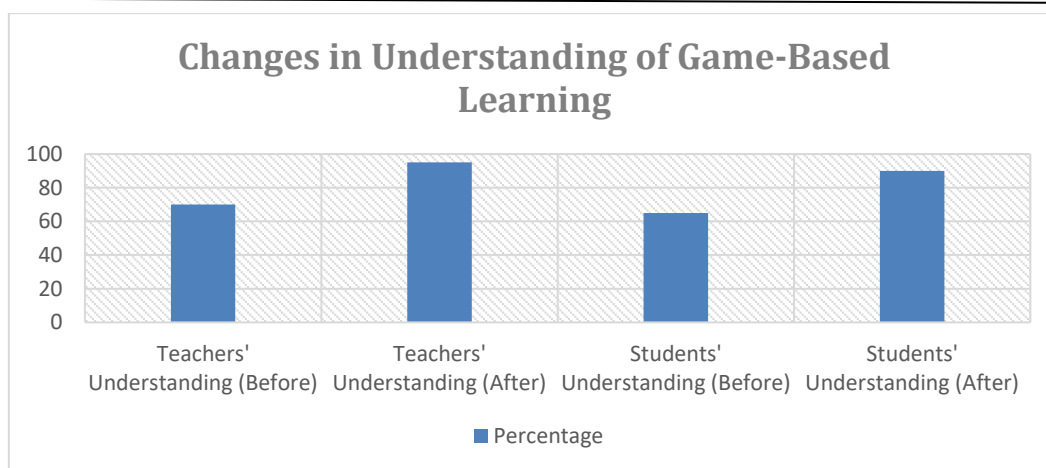
This community service activity was held to socialize the concept and application of game-based learning to teachers and students, as part of the digital transformation of education. The socialization was conducted through various interactive activities that involved introducing the benefits and challenges of implementing games in the learning process, as well as their impact on student learning effectiveness. This activity was attended by 45 teachers and 45 students as representatives of SMAN 1 Kefamenanu.



Picture 1. Team Presents Game-Based Learning Materials

The results of this community service activity indicate that the implementation of game-based learning among teachers and students has shown a very positive response. The significant increase in understanding after the socialization activity indicates that the information conveyed through this activity was well-received. This indicates that socialization using an interactive, technology-based approach can help improve understanding of new concepts, such as game-based learning, which is still relatively new in Indonesian education.

This socialization also demonstrated the importance of involving various stakeholders in the digital education transformation process. Teachers, as the spearhead of education, need to be equipped with the understanding and skills to utilize technology in the teaching and learning process, including the use of games. Students, as the primary beneficiaries of education, also need to be given firsthand experience with more interactive and engaging learning methods. Below is presented the positive changes of teachers' and students' understanding towards game-based learning and its implementation on digital education.



**Graph 1.** Changes in Understanding of Game-Based Learning before and after Socialization

Before the socialization, a baseline survey was conducted to measure participants' understanding of game-based learning. The results indicated that 70% of teachers and 65% of students did not fully understand the concept and benefits of game-based learning. Following the socialization, a follow-up survey was conducted to gauge understanding. The results showed that 95% of teachers and 90% of students demonstrated a significant increase in understanding regarding the use of games in learning.

Based on a questionnaire evaluation conducted after the socialization, the majority of participants expressed high enthusiasm for the application of games in learning. As much as 85% of teachers believed that games could increase student learning interest, and 90% of students found game-based learning methods more engaging than conventional methods. This was in line with the previous study conducted by Tampubolon (2025) that revealed the impact of using game-based learning in classroom setting. Most teachers and students hope this concept can be further implemented in the classroom. Teachers want more training on how to integrate games into the curriculum and daily learning, while students want more varied and interactive game types.

However, despite the high level of enthusiasm, challenges related to limited resources remain a major inhibiting factor. Limited access to technological devices and uneven internet connections are obstacles that need to be addressed in future steps. Therefore, concrete steps are needed to provide facilities and infrastructure to support the implementation of game-based learning in schools, especially in areas with limited resources. The implementation of games in education depends not only on the availability of technology but also on how the game design itself supports learning objectives. Therefore, ongoing efforts are needed to develop games that are not only engaging but also effective in improving student competency.

#### 4. CONCLUSION AND SUGGESTION

The socialization of game-based learning has had a positive impact on increasing teachers' and students' understanding of the benefits and applications of games in learning. While there are challenges to overcome, such as limited resources, further steps must be taken to ensure the success of Indonesia's digital education transformation. Furthermore, further evaluation and development of games used in learning are crucial to maintain their relevance and effectiveness in achieving educational goals.

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