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Improving Elementary Teacher's Skills by Using Digital Tools for Interactive Learning

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Abstract. Improving the competence of teachers at Campago Ipuh Elementary School, Bukittinggi still faces challenges in utilizing technology for interactive learning. Along with the development of the era, the use of digital tools in the learning process is important to improve the quality of education. Therefore, training is needed for teachers to optimize the use of digital technology in teaching. The purpose of this service is to improve the competence of elementary school teachers in utilizing digital tools in interactive learning. The methodology used is training and mentoring in the form of workshops that teach the use of various digital learning applications, as well as providing simulations of the use of these tools in everyday learning. The results obtained show a significant increase in teachers' ability to use digital technology, especially in designing more interesting and effective interactive learning. Teachers are also more confident in integrating technology in the classroom. In conclusion, the use of digital tools has proven effective in improving teacher competence and learning quality. The recommendation from this activity is that similar training be carried out continuously and involve more teachers in other areas.

Keywords: Community Service, Digital Tools, Educational Technology, Interactive Learning, Teacher Competence

1 Introduction

Quality education is one of the main factors in creating superior human resources. One of the keys to improving the quality of education is to improve teacher competence, especially in utilising digital technology. In this digital era, technology-based learning is not only an option, but a necessity. However, many teachers still struggle to integrate technology into the learning process, especially in remote areas. One of them is Campago Ipuh Primary School, which has difficulties in utilising technology to support interactive learning, especially limited human resources or teachers in mastering the creation of learning media that makes students more active in building their knowledge.

The use of constructivist theories from Piaget and Vygotsky is appropriate as a foundation in promoting technology-enhanced interactive learning, provided it is appropriately integrated in learning practices. Piaget emphasised the importance of students' active involvement in constructing knowledge through exploration and interaction with the environment, which can be facilitated by technology such as simulation and interactive media. Meanwhile, Vygotsky emphasised the social aspects of learning through the concepts of Zone of Proximal Development (ZPD) and scaffolding, which are highly relevant to the use of collaborative technologies such as discussion forums, video conferencing and digital tools that support collaboration and structured guidance [1] [2]. Good integration occurs when technology is not only a technical aid, but also a pedagogical tool that allows students to learn actively and meaningfully, both individually and socially, with the teacher acting as a facilitator who directs the process [3] [4].

The post-pandemic digital transition has driven significant changes in education, including at the primary school level [5]. However, there are still big challenges, especially related to teachers' limitations in mastering and using various digital applications. Although educational technology is increasingly available, many primary

school teachers do not have adequate digital literacy competencies, so the use of technology in learning tends to be a formality and less effective. This limitation has an impact on the low quality of learning outcomes because students do not get an interactive and meaningful learning experience. In addition, the digital transition also widens the gap in access to education technology between schools in developed and underdeveloped areas, creating inequalities in student learning achievement. To realise quality learning outcomes and equitable access, continuous training for teachers, the provision of user-friendly applications, as well as policies to equitably distribute infrastructure and strengthen digital communities within primary schools are needed.

SD Campago Ipuh is located in a semi-urban area in Mandiangin Koto Selayan Sub-district, Bukittinggi City, West Sumatra. The school is located in an area that is quite densely populated, but not yet fully covered by adequate digital infrastructure. Internet connection in the school environment is often unstable, with limited speed, thus becoming one of the main obstacles in optimising the use of information technology in learning activities. In addition, hardware facilities such as computers, projectors or tablets are still limited in number and most classrooms are not equipped with the ideal learning technology infrastructure.

In terms of human resources, teachers at Campago Ipuh primary school are eager to develop their digital competencies, but in general they still have limitations in the pedagogical use of technology. Based on initial observations and interviews, it is known that most teachers only have basic experience in using technology tools, such as Microsoft PowerPoint or simple office applications. Their ability to access and utilise online learning platforms and digital interactive applications such as Google Classroom, Kahoot or Quizizz was very limited prior to the training. This indicates a gap between the potential for technology utilisation and teachers' actual digital competencies.

Under these conditions, systematic and sustainable efforts are needed to improve teachers' readiness to face the demands of 21st century learning, especially in utilising digital technology to create interactive, participatory and meaningful learning processes. Through this community service activity, training and mentoring are focused on addressing these local needs, while empowering teachers to be more confident and skilled in integrating technology in their daily teaching practices [6] [7] [8].

In the future, it is expected that the use of technology by teachers at SD Campago Ipuh can continue to develop and become part of the habits in the learning process. With the improvement of teacher competence, the quality of learning in this school is expected to improve, so that students can more easily understand the subject matter and be more interested in learning [9]. In addition, it is hoped that similar activities can be held on an ongoing basis to reach more teachers in other areas.

This community service activity also provides an illustration that teacher empowerment through technology-based training is a strategic step in facing the challenges of education in the digital era. Therefore, in the future, further support is needed from various parties, both the government and educational institutions, to continue to improve the capacity of teachers in utilizing technology in order to achieve quality education goals.

2 Implementation Methods

The type of methodology used in this community service article is a participatory methodology with a training and mentoring approach. This methodology prioritizes the active involvement of teachers as participants, and involves lecturers and students from the Informatics and Computer Engineering Education Study Program (PTIK) UIN Bukittinggi in the learning and mentoring process. The steps taken in this activity are as follows [6] [10]:

1. Identification of Problems and Teacher Needs
   The first step taken was to identify the problems and needs of teachers at SD Campago Ipuh related to the use of technology in learning. The community service team, consisting of lecturers and students from the Information and Communication Technology Education Study Program (PTIK) UIN Bukittinggi, conducted interviews with the principal and teachers to understand the obstacles faced, and to find out to what extent teachers have integrated technology in their classes. In addition, observations were also made of the learning process taking place at the school. The results of this identification became the basis for designing training materials that are relevant to the real needs of teachers.
2. Training Material Design
   Based on the results of the problem identification, the community service team designed training materials that cover various topics on the use of digital technology in interactive learning. This material includes an introduction to learning applications that can be used by teachers to make learning more interesting, such as the use of Google Classroom, Quizizz, Kahoot, and other learning applications. In addition, the material also covers how to create a technology-based learning plan that can increase student participation and involvement.

3. Implementation of the Training Workshop
   The training workshop was conducted directly at Campago Ipuh Elementary School by presenting competent speakers in the field of educational technology. The main speakers were a team of lecturers from the PTIK UIN Bukittinggi Study Program who had expertise in the use of digital tools for learning. This training also involved seven students from PTIK UIN Bukittinggi who had been given special training previously. These students assisted in practical assistance and provided technical support to teachers during the training. This training was held in several sessions which included an introduction to digital tools, demonstrations of application use, and practical exercises for teachers. Each participant was given the opportunity to try using the learning application in the form of a simulation, so that they could directly experience the experience of using the technology in the classroom.
4. Mentoring and Field Practice
   After the workshop, direct mentoring was carried out by the community service team to the teachers to ensure proper understanding and implementation of the material that had been given. This mentoring was carried out by visiting classes and providing technical assistance if needed. Students who were members of the community service team also participated in this mentoring, providing guidance and practical assistance in the application of digital technology in the classroom. In addition, teachers were given the opportunity to practice the use of technology in daily learning, such as holding online exams or creating digital-based assignments that could be accessed by students.
5. Evaluation and Reflection
   After the training and mentoring activities, an evaluation was conducted to measure the extent to which teachers had understood and implemented digital tools in their learning. This evaluation was conducted through observation, interviews, and surveys filled out by workshop participants. In addition, teachers were asked to provide reflections on the changes they felt in the teaching process and students' responses to the use of technology in learning. The service team, including lecturers and students, collected this evaluation data to evaluate the success of the training program.
6. Preparation of Community Service Results Report
   After the evaluation is completed, the community service team prepares a report that covers the entire series of activities that have been carried out, the results achieved, and an analysis of the effectiveness of the training and its impact on the quality of learning at SD Campago Ipuh. This report also includes recommendations for further development in the use of technology in the school. In preparing the report, the team of lecturers and students together process the data obtained during the activity and prepare a comprehensive report.
7. Recommendations for Sustainability
   As a final step, the community service team provided recommendations to the school and local government regarding the importance of ongoing training for teachers in mastering educational technology. These recommendations include suggestions for regular training that is not only limited to the use of applications, but also to improving teachers' abilities in designing more effective and engaging technology-based learning.

3 Results and Discussion

Contextual factors at Campago Ipuh primary school, such as limited digital infrastructure and teachers' low basic competence in technology, greatly influenced the design and objectives of the training. The school's limited internet access and lack of devices such as computers and projectors prompted the designers to choose digital applications that are lightweight, easy to use and compatible with teachers' own devices, such as smartphones. Therefore, the training materials focused on using familiar and practical platforms such as Google Classroom, Kahoot, and Quizizz. In addition, as most teachers only have basic experience in using technology, the training is designed to be gradual and hands-on, so that it is easy to understand and implement in teaching and learning activities.

In addition to technical factors, the training approach also considers the social and cultural characteristics of schools located in semi-urban areas. To support collaborative learning and build teachers' confidence, this activity integrates intensive mentoring sessions by lecturers and students who assist teachers directly in classroom practice. This approach is aligned with Vygotsky's principles of social constructivism that emphasise the importance of interaction and scaffolding in the learning process. Thus, the main objective of the workshop is not only to improve technical skills, but also to build a sustainable and contextualised digital learning ecosystem, and bridge the digital divide that still exists at the primary school level.

The community service activity (PKM) at SD Campago Ipuh aims to improve teachers' competence in utilising digital technology for interactive learning. After the training and mentoring, there was a significant improvement in teachers' ability to use digital tools, as well as positive changes in the learning process in the

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classroom. The results show that teachers are more confident in integrating technology into their teaching [11] [12].

The results of the training showed that the majority of teachers experienced a significant improvement in the use of digital learning applications. Before the training, most teachers only used technology in its basic form, such as PowerPoint presentations. After the training, they began to utilise apps such as Google Classroom, Kahoot and Quizizz to make learning more interactive and engaging [13] [14] [15]. The use of this application allows students to be more involved in learning activities, whether in the form of quizzes, assignments, or online discussions.

From the results of the evaluation conducted after the training, data was obtained showing that 80% of teachers felt more confident in using digital technology for learning. This evaluation was conducted through questionnaires and interviews with workshop participants. In addition, there was a significant increase in teachers' understanding of how to use digital applications that they were previously unfamiliar with [16] [17].

After receiving training, teachers began implementing technology-based learning using various applications that were taught. For example, some teachers have started using Kahoot to host interactive quizzes at the end of each lesson, allowing students to participate directly and actively. Using Google Classroom has also made it easier to collect assignments and provide feedback more efficiently.

During the mentoring session, the service team consisting of lecturers and students participated in helping teachers use the applications that had been taught. This mentoring was carried out by directly accompanying the learning process in the classroom. The students involved helped teachers in solving technical obstacles faced when using technological devices in the classroom. This allows teachers to master technology more quickly and apply it more effectively in learning [18] [19] .

Student responses to technology-based learning were very positive. Based on interviews with students, they feel more interested and enthusiastic in taking lessons that use applications such as Quizizz and Kahoot. Students expressed that learning became more fun and interactive, which made it easier for them to understand the material being taught [20].

Theoretically, the approach used in this activity is in line with the constructivist theories of Piaget and Vygotsky. Piaget emphasises that learning occurs when students actively construct their knowledge through interaction with the environment, in accordance with their cognitive development. In this context, apps such as Kahoot and Quizizz provide opportunities for students to explore, answer questions and learn through interactive hands-on experiences, reflecting the process of assimilation and accommodation in Piaget's framework. On the other hand, Vygotsky's approach emphasises the social aspects of learning, particularly through the concepts of Zone of Proximal Development (ZPD) and scaffolding. The assistance provided by lecturers and students to teachers during the learning process in the classroom reflects a form of scaffolding, where teachers are guided in mastering new technology until they are able to use it independently. Similarly, when teachers use digital applications in learning, they create a space for social interaction between teachers and students, as well as between students themselves, which strengthens collaborative knowledge construction.

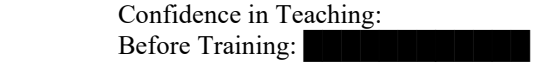
Students' response to technology-based learning is very positive. Based on interviews with students, they feel more interested and excited in following lessons that use applications such as Quizizz and Kahoot. Students revealed that learning becomes more fun and interactive, which makes it easier for them to understand the material taught. This shows that technology not only supports the cognitive aspect of learning, but also increases students' learning motivation [3].

Although the results achieved are quite positive, some challenges remain, especially related to the limited technology devices in schools. Not all teachers have adequate computer or tablet devices, and some students also face obstacles in optimally accessing the applications. Therefore, further efforts are needed to ensure that every teacher and student has adequate access to the technology needed to support learning.

Table 1. Results of Teacher Competency Improvement Evaluation

Aspect	Before Training	After Training	Increase (%)
Use of learning applications	35%	85%	50%
Confidence in teaching	40%	80%	40%
Ability to create digital quizzes	30%	75%	45%
Ability to use Google Classroom	25%	70%	45%

Training Success Evaluation Results Diagram:



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After Training : 80%

Learning Application Usage:
Before Training: 35%
After Training : 85%
Digital Quiz Making Skills:
Before Training: 30%
After Training : 75%

Ability to Use Google Classroom:
Before Training: 25%
After Training : 70%

Overall, the results of this service activity showed a significant improvement in the competence of teachers at SD Campago Ipuh in utilising technology for learning. The application of digital applications in learning has successfully improved student-teacher interaction and simplified the overall learning process. Although challenges related to facilities still exist, this effort provides evidence that with proper training and intensive mentoring, teachers can overcome technical obstacles and utilise technology well in learning. Moreover, it provides evidence that learning approaches based on constructivist theory can be effectively implemented in primary schools through technology, thereby encouraging a more meaningful and collaborative learning process [21] [22] .

It is hoped that ongoing training and support from various parties, including the government and educational institutions, can continue to strengthen the capacity of teachers in this area, as well as improve the quality of education to be more equitable and effective throughout the region [23][16] .

Figure 1. PKM activities of the PTIK UIN Bukittinggi Lecturer Team and 7 PTIK Students at Campago Ipuh Elementary School

4 Conclusions

The community service workshop activity at Campago Ipuh Elementary School succeeded in achieving its goal of improving teacher competence in utilizing digital technology for interactive learning. After attending the training, most teachers experienced significant improvements in their understanding and skills in using digital

applications such as Google Classroom, Kahoot, and Quizizz. Teachers also become more confident in integrating technology into everyday learning, which has a positive impact on student interaction and engagement in the classroom. Students' responses to technology-based learning were also very positive, indicating that they were more interested and actively participated in learning activities.

However, although the training has succeeded in improving teachers' skills, challenges related to limited technological devices and internet access in schools remain obstacles. Therefore, in order for technology-based learning to run more optimally, technological infrastructure issues need to receive more attention.

Recommendations from the PKM activities that have been carried out by the PTIK Lecturer Team are:

1. Continuous Training for Teachers In order for teachers' competence in using educational technology to continue to develop, it is recommended that training be conducted continuously. This advanced training can accommodate the development of new applications and more innovative technology-based teaching techniques.
2. Technology Infrastructure Improvement Technology facilities at Campago Ipuh Elementary School need to be improved, such as providing computers, tablets, and a more stable internet connection. This will ensure that teachers and students have adequate access to implement technology-based learning.
3. Providing Ongoing Technical Support In addition to formal training, it is important to provide ongoing technical support to teachers through mentoring and direct consultation. Students and lecturers from the PTIK UIN Bukittinggi Study Program can continue their role in providing routine technical assistance in schools to help teachers overcome obstacles that arise.
4. Building a Digital Learning Community The formation of a teacher community that is active in sharing experiences and knowledge about the use of technology in learning will help accelerate the adoption of technology among teachers. This community can be held online or offline and become a forum for teachers to learn from each other.
5. Increasing Parent and Community Participation To maximize the benefits of technology-based learning, it is recommended to involve parents in the learning process, especially in supporting their children to access digital learning materials at home. Socialization about the importance of educational technology to parents and the surrounding community also needs to be done.

With these recommendations, it is hoped that Campago Ipuh Elementary School and other schools in similar areas can continue to improve the quality of technology-based learning, providing a positive impact on the development of more equitable and quality education.

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