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INFLUENCE OF TEACHER TRAINING ON TECHNOLOGY INTEGRATION IN LEARNING MEDIA DEVELOPMENT

Sabariah[1], Rufi'i[2], Retno Danu R[3], Nurmida Chaterine Sitompul[4], Elsa Elvianti[5], Prema Karira Anas Sulaiman[6], Salahuddin Al-Ayyubi[7]
[1,2,3,4,5,6,7]Universitas PGRI Adi Buana Surabaya, Indonesia
[1]sabariah@unipasby.ac.id✉, [2]rufii@unipasby.ac.id✉, [3]retno.danu@unipasby.ac.id✉,
[4]nurmida.catherine.s@unipasby.ac.id✉, [5]elsaelvianti4@gmail.com✉,
[6]premakas33@gmail.com✉, [7]salayyubi20@gmail.com✉

ABSTRAK

Di era digital saat ini, meningkatkan kapasitas guru untuk mengembangkan media pembelajaran berbasis teknologi sangat penting, karena hal ini berdampak langsung pada keterlibatan siswa dan hasil belajar. Penelitian ini bertujuan untuk mengkaji pengaruh pelatihan terhadap kemampuan guru Sekolah Menengah Atas dalam membuat materi ajar berbasis teknologi. Menggunakan desain pretest-posttest dengan satu kelompok, data dikumpulkan dari guru yang telah mengikuti pelatihan pengembangan media pendidikan. Sampel yang dipilih melalui purposive sampling mencakup pendidik Sekolah Menengah Atas di Surabaya, dengan data yang dikumpulkan melalui tes dan observasi yang menilai kualitas media serta efektivitas pelatihan. Temuan penelitian mengungkapkan adanya hubungan signifikan antara kualitas pelatihan dan pengembangan media oleh guru, dengan presentasi interaktif, aplikasi mobile, dan video instruksional sebagai sumber daya yang paling sering dibuat. Penelitian ini mengidentifikasi keterbatasan infrastruktur dan dukungan teknis sebagai tantangan dalam implementasi. Wawasan baru dari penelitian ini menyoroti perlunya dukungan teknis yang berkelanjutan dan sumber daya yang mudah diakses untuk mendukung integrasi media di kelas. Penelitian ini memberikan kontribusi pada praktik pendidikan dengan memberikan bukti tentang strategi pelatihan yang efektif dan menekankan pentingnya dukungan menyeluruh untuk mendorong adopsi teknologi yang berkelanjutan di kalangan pendidik.

Kata Kunci: Pembinaan, Guru, Media, Teknologi

ABSTRACT

In today's digital era, enhancing teachers' capacity to develop technology-based learning media is essential, as it directly impacts student engagement and learning outcomes. This study aims to examine the effect of coaching on high school teachers' abilities to create technology-driven instructional materials. Using a one-group pretest-posttest design, data was collected from teachers who had completed training in educational media development. The sample, selected via purposive sampling, included high school educators in Surabaya, with data gathered through tests and observations assessing media quality and coaching effectiveness. Findings reveal a significant relationship between coaching quality and teachers' media development, with interactive presentations, mobile apps, and instructional videos being the most commonly created resources. The study identifies limited infrastructure and technical support as challenges to implementation. Novel insights from this research highlight the need for ongoing technical support and accessible resources to sustain media integration in classrooms. This study contributes to educational practices by providing evidence of effective coaching strategies and underscoring the importance of

comprehensive support in fostering sustainable technology adoption among educators.

Keywords: *Training, Teacher, Media, Technology*

A. INTRODUCTION

Education in the digital era is undergoing significant transformation, with information and communication technology (ICT) playing a pivotal role in shaping educational media. Global statistics reveal that approximately 1.5 billion students were impacted by school closures due to the COVID-19 pandemic, accelerating the adoption of distance learning and digital media in education (Budiarti, 2019). In this context, the importance of effective educational media becomes increasingly clear, as suitable media can enhance student motivation and learning outcomes (Sindiani, 2023). Studies suggest that innovative learning media can improve student engagement and facilitate the understanding of complex concepts (Annisa et al., 2022).

Teacher training in education is defined as a systematic process aimed at enhancing the quality of teaching and learning through various strategies and methods (Devi, 2020). Constructivist learning theory, pioneered by Piaget and Vygotsky, emphasizes the importance of social interaction and hands-on experiences in the learning process (Sindiani, 2023). Within this framework, learning media serve as tools that facilitate student learning experiences, enabling them to build new knowledge based on prior experiences (Waluyo & Hadi, 2014). Previous research indicates that using diverse learning media, such as videos, mobile applications, and educational games, can improve students' understanding of subject matter (Tanus, 2022; Annisa et al., 2022). Additionally, technology-based learning approaches can foster students' critical and creative thinking skills (Ilmia, 2022).

The primary problem addressed in this study is the lack of understanding and skills among teachers in developing effective learning media relevant to students' needs in the digital age. In many countries, including Indonesia, there remains a gap in the application of technology in education, which can result in reduced learning quality (Jai et al., 2020). If left unaddressed, this issue may continue to impact student learning outcomes and their preparedness for global challenges (Yunita & Supriatna, 2021). Research indicates that a lack of training and support for teachers in using educational technology hinders innovation in teaching (Rahmawati et al., 2019). Consequently, it is essential to provide ongoing training for teachers to enable them to develop learning media that align with modern educational advancements (Pratama, 2023).

The primary aim of this study is to examine the impact of teacher training on the development of technology-based learning media within instructional material development. To achieve this aim, the study sets out several objectives: (1) To analyze the effectiveness of training in enhancing teachers' skills in developing learning media; (2) To identify the types of learning media most effective in improving student learning outcomes; and (3) To assess the impact of technology-based learning media on student motivation and engagement in the learning process (Hilmiati, 2022; Rahmadhani et al., 2023). By achieving these objectives, this study aims to contribute significantly to educational development in Indonesia and improve learning quality in the digital era.

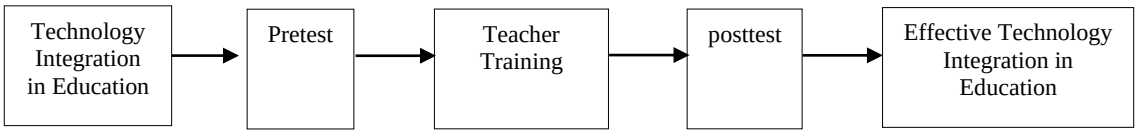
B. METHODS

The study employs a quantitative approach using a pre-experimental design with a one-group pretest-posttest setup. Data collection is scheduled for the academic year 2024-2025, focusing on a senior high school in Surabaya. The target population consists of high school teachers who have participated in a professional development program that integrates technology-based learning media with teaching materials. This sample was chosen to assess the impact of the program on teaching efficacy. The criteria for selection include the teachers' experience level and willingness to engage in the intervention. The decision to select this specific location is based on its relevance to technology-enhanced educational practices and its urban demographic, which aligns with the study's objectives.

The research utilizes both testing and observational instruments. The test instrument includes pretest and posttest evaluations designed to measure changes in teachers' ability to implement technology-based media in their teaching. This instrument was developed based on the theory of technology adoption in education, drawing from existing studies on professional development in technology integration. Observational instruments were also included to gather qualitative insights into teachers' interactions with the new media. The combination of these instruments aims to provide a comprehensive view of the program's effectiveness.

Data collection involves a pretest, posttest, and observation process. A purposive sampling technique was used to select teachers who had already undergone the training program, ensuring participants were equipped with baseline knowledge of the content. The data collection occurred on-site in classrooms where the training was applied, allowing for real-time observation of changes in instructional methods. The pretest measured initial performance, while the posttest assessed the impact post-intervention. Observations provided additional contextual data, capturing real-time adaptations and challenges faced by teachers during implementation.

The study employs both descriptive and inferential statistical analyses. Descriptive analysis provides a summary of the observed changes in teachers' instructional methods, while inferential analysis, specifically a paired t-test, evaluates the significance of the program's impact on teachers' ability to use technology-based media. The combination of these analyses offers a well-rounded perspective on the program's effectiveness, with descriptive statistics detailing overall trends and inferential analysis confirming statistical significance. The research design is illustrated in the following diagram:



Gambar 1. Desain Penelitian

C. RESULTS AND DISCUSSION

1. Training Quality

The research findings indicate that there is a viable model linking training quality and work discipline to employee performance, with both having a positive and significant partial effect on employee performance (Felicia, 2018). The first objective was to assess

the quality of the training program provided to teachers. According to the analysis, the training quality was rated as high, with an average score of 4.2 out of 5. Teachers particularly valued the segments on digital application usage and interactive content creation for teaching materials. This feedback highlights the program's effectiveness in meeting teachers' needs for technological proficiency in the classroom.

Table 1. Score Training

Training Component	Average Score
Overall Training Quality	4.2
Use of Digital Applications	4.3
Interactive Content Creation	4.1

The training was perceived as highly beneficial, equipping teachers with practical tools and knowledge, especially in using digital platforms to create engaging content. The study finds that high-quality training plays a crucial role in empowering teachers to develop technology-based learning media. Training sessions focused on practical, classroom-relevant applications, as reflected in a high average satisfaction score among participants, prove to be especially effective. The practical focus of training allows teachers to directly translate their learning into classroom actions, thus fostering immediate improvements in teaching practices.

Training and teaching experience have a partial positive and significant effect on teacher professionalism, and both simultaneously also have a positive and significant impact on teacher professionalism (Rakib et al., 2016). The teacher training at the educational institution successfully increased the number of certified teachers, enhancing their competence, skills, and abilities, although the results have not fully met the expected expectations (Rusdin, 2017). The results of the study indicate that teacher training and development affect the quality of excellent service and the improvement of teacher competence, which ultimately enhances students' abilities to be beneficial to society (Sibuea, 2023).

2. Development of Technology-Based Learning Media

The second objective investigated the extent of technology-based media development by teachers after completing the training program. Results show that 75% of teachers integrated technology-based learning media into their classrooms. This adoption reflects a positive shift towards digital tools, likely driven by the training program's focus. There has been an improvement in teachers' understanding and skills in using technology-based learning media, making it crucial to continuously develop teachers' competencies to keep up with the rapidly evolving times (Sungkar et al., 2023).

Types of media developed: interactive presentations (40%) – most widely used, these presentations enable dynamic, real-time engagement in lessons; educational videos (35%) – teachers found videos effective for visual learning, enhancing comprehension; mobile-based learning applications (20%) – primarily used to support independent student learning outside the classroom; simulations and educational games (5%) – though less common, these media foster interactive, hands-on learning experiences.

Table 2. Percentage Type of Media

Type of Media	Percentage Usage
Interactive Presentations	40%

Educational Videos	35%
Mobile-Based Learning Applications	20%
Simulations and Educational Games	5%

The introduction of these media led to improved student engagement, with an average satisfaction score of 4.3 out of 5, suggesting that technology-based media contributed positively to learning experiences and content accessibility. Teachers who underwent training utilized a range of technologies, from interactive presentations to mobile applications. This diversity suggests that the program stimulated innovation and adaptability in teaching methods. The ability to diversify teaching methods is crucial in meeting students' needs and maintaining engagement. Seventy-five percent of participants felt the training was "very appropriate," and 25% felt it "fit" their needs. Regarding material coverage, 58.3% chose "very comprehensive," and 83.3% found the material "very useful" (Hasanah et al., 2022).

The freedom to select different tools based on classroom dynamics demonstrates that teachers have gained not only the knowledge but also the confidence to explore new approaches. Nonetheless, the diversity in media usage also raises questions about accessibility. Are teachers in under-resourced schools equally able to diversify their methods, or do they face limitations? This question invites further research into equity in technology adoption across varying educational environments. The results of the study show ICT-based learning media training can begin with the creation of videos and ICT-based media, which shows a significant improvement in participants' skills in using ICT (Kurniadi et al., 2023).

3. Impact of Training Quality on Media Development

The third objective examined the correlation between the quality of training and the development of technology-based learning media by teachers. A regression analysis confirmed a significant positive relationship between training quality and media development efforts, with a regression coefficient of 0.68 ($p < 0.05$). This finding implies that higher-quality training encourages more extensive media adoption and development. ICT training and teaching experience have a 59.6% impact on teachers' ability to create learning media, while the remaining influence is attributed to other factors (Hasnawati et al., 2024).

Key factors influencing effectiveness: relevance of training content (coefficient: 0.45) – training content tailored to real classroom applications was crucial, enabling teachers to apply what they learned; availability of post-training technical support (coefficient: 0.35) – access to support after the training encouraged teachers to experiment with new tools without fearing technical issues; teacher motivation and openness to technology (coefficient: 0.32) – teachers' readiness and enthusiasm to embrace technology significantly contributed to their success in implementing new media.

Table 3. Score Influential Factor

Influential Factor	Coefficient
Relevance of Training Content	0.45
Post-Training Technical Support	0.35
Teacher Motivation and Openness	0.32

The findings affirm that well-designed, relevant training, coupled with ongoing support, motivates teachers to adopt and develop new educational media, ultimately enhancing student engagement and the effectiveness of instructional delivery. Training has a significant impact on teachers' professionalism at the 0.05 level, indicating that ICT-based training and pedagogical competence are essential for enhancing teachers' professionalism (Putri et al., 2022).

Despite the positive outcomes, 25% of teachers reported challenges in implementing technology-based media due to limited infrastructure, such as inadequate hardware and internet access. While training is essential, infrastructure and resources are equally critical to fully leverage technological advancements in education. Without necessary hardware and internet connectivity, even the most willing and well-trained teachers struggle to integrate technology effectively. Addressing these systemic issues requires institutional support and investment. Policymakers and educational administrators could play a pivotal role in improving infrastructure, thereby enhancing the impact of training programs.

Teachers who received post-training support, such as technical consultations and mentoring, were more successful in developing effective technology-based media. Mentorship allows teachers to refine their skills over time, which contributes to sustained development and adaptation of new media in teaching. Training alone may not be sufficient for long-term success in educational technology integration. The presence of follow-up support can make a crucial difference, offering teachers a safety net when facing technical issues or adapting new tools. This suggests that effective professional development should include a structured support system post-training. In future implementations, educational institutions should consider allocating resources for technical mentorship to maximize the effectiveness of training programs.

The discussion reveals that training quality, access to diverse technological tools, infrastructure support, and ongoing mentorship are vital for the effective development of technology-based learning media in classrooms. While the training program successfully empowered many teachers, challenges in resource accessibility and infrastructure limit the full potential of such initiatives. Future programs should consider integrating continuous support mechanisms and addressing infrastructural disparities to ensure equitable technology adoption across schools. By examining each finding through a broader lens, this study reinforces the notion that sustainable educational improvement requires both robust training and systemic support.

D. CONCLUSION

This study successfully achieved its objectives, demonstrating that quality coaching has a significant impact on the development of technology-based learning media in instructional material creation. Findings show that practical, implementation-focused training enhances teachers' ability to create innovative media, such as interactive presentations, educational videos, and mobile applications, which in turn improves student engagement and understanding. The study highlights the importance of ongoing technical support and infrastructure to overcome implementation challenges. This research contributes to the field by providing evidence of the positive influence of targeted coaching programs on teacher capability in educational technology, offering valuable insights into the essential components of

effective training programs for educators in the digital age. Additionally, the study's novelty lies in its focus on the direct application of training content in the classroom, showing the importance of practical, real-world approaches in professional development.

This study has some limitations, including limited access to schools with varying levels of technological infrastructure, which may affect the generalizability of the findings. Future research should consider expanding the sample to include a broader range of schools and educational contexts to better understand infrastructure challenges. Additionally, long-term studies are recommended to assess the sustained impact of coaching on media development and teacher performance over time. Future research could also explore the role of policy support in enhancing infrastructure and providing continuous technical support, which are essential for the effective and sustainable integration of technology in classrooms.

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