Implementation of Technology-Based Learning Media in Javanese Language Learning Phase F

Sabrina Zalfa Ociana[1*]; Agus Yuwono[2]

[1,2]*Department of Javanese Language and Literature, Universitas Negeri Semarang, Indonesia*
[1*]*Corresponding Email: sabrina07ociana@students.unnes.ac.id*

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Abstract: This study aims to describe the "Implementation of Technology-Based Learning Media in Javanese Language Learning Phase F students". It also identifies the problems encountered during implementation and the solutions applied to overcome them. The research is motivated by the need for adaptable learning in response to technological advancements, particularly within the Javanese local content curriculum, which students often find unengaging. We adopted a descriptive qualitative approach with a case study research design. The study was conducted at SMA Negeri 1 and SMA Negeri 2 Purbalingga, involving teachers, students, and school principals as subjects. Data collection techniques included direct observation of the learning process, in-depth interviews with various stakeholders, and documentation of learning tools and media. The findings indicate that technology-based press, such as PowerPoint (PPT), learning videos, and interactive applications like Quizizz, Kahoot, and Canva, significantly enhanced student participation and comprehension. The primary obstacles to implementing these media included limited internet access, low digital literacy among teachers, and uneven distribution of infrastructure. Solutions implemented to address these issues involved teacher training, providing offline media, and improving school technology infrastructure. This research highlights the importance of integrating technology into local content learning, which should be grounded in cultural wisdom and contemporary needs.

Abstrak: Penelitian ini bertujuan untuk mendeskripsikan implementasi media pembelajaran berbasis teknologi dalam pembelajaran Bahasa Jawa Fase F, mengidentifikasi permasalahan yang dihadapi, serta solusi yang diterapkan untuk mengatasi permasalahan tersebut. Penelitian ini dilatarbelakangi oleh kebutuhan akan pembelajaran yang adaptif terhadap perkembangan teknologi, khususnya dalam muatan lokal Bahasa Jawa yang sering dianggap kurang menarik oleh peserta didik. Pendekatan yang digunakan adalah deskriptif kualitatif dengan jenis penelitian studi kasus. Penelitian dilakukan di SMA Negeri 1 dan SMA Negeri 2 Purbalingga dengan melibatkan guru, peserta didik, dan kepala sekolah sebagai subjek. Teknik pengumpulan data meliputi observasi langsung terhadap proses pembelajaran, wawancara mendalam dengan berbagai pihak, serta dokumentasi terhadap perangkat dan media ajar. Hasil penelitian menunjukkan bahwa media berbasis teknologi seperti PowerPoint (PPT), video pembelajaran, dan aplikasi interaktif seperti Quizizz, Kahoot dan Canva mampu meningkatkan partisipasi serta pemahaman peserta didik. Kendala utama dalam implementasi media ini meliputi keterbatasan jaringan internet, rendahnya literasi digital guru, serta sarana prasarana yang belum merata. Adapun solusi yang dilakukan mencakup pelatihan guru, penyediaan media offline, serta perbaikan infrastruktur teknologi sekolah. Penelitian ini menegaskan pentingnya integrasi teknologi dalam pembelajaran muatan lokal yang berbasis kearifan budaya dan kebutuhan zaman.

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A. Introduction

Technological advancements have emerged as a crucial factor in transforming various sectors of life, including education (Kumar, 2023). This development has a significant impact on how we learn and teach, particularly in the context of rapid digitalization. Today's students, mainly belonging to Generation Z, are known for their profound familiarity with the digital world and are more attracted to learning models that are interactive, flexible, and engaging (Nuryadin, 2024). In this era of digitalization, children and adolescents have extensive access to various technologies, including smartphones, computers, and the internet (Rusli et al., 2024). Technology has the power to reshape human thought, work, and lifestyles, and its influence on education is equally profound (Tafonao, 2018). Education, in turn, enables individuals to keep pace with the increasingly rapid advancements of our time (Efendi et al., 2022). This necessitates an adaptation in learning media, particularly in the instruction of regional languages like Javanese, which are often perceived as difficult, tedious, and less relevant to students' daily lives.

Despite Javanese language instruction being provided since elementary school, many secondary-level students continue to face difficulties comprehending the subject matter. This can be attributed to various factors, including the complexity of the language structure, the diverse speech levels (undha-usuk basa), and the limited use of Javanese in daily life. Furthermore, the learning media predominantly used remain conventional, unengaging, and often unsuitable for the learning characteristics of contemporary students. According to Hidayat et al (2021), teacher creativity is crucial in preparing lessons, as it fosters the development of student skills and enables the adaptation of material to technological advancements. Given that teaching materials and methods are intrinsically linked, technological progress necessitates that teachers develop innovative learning media (Darwati & Alimah, 2022).

Initial observations at SMA Negeri 1 and SMA Negeri 2 Purbalingga reveal that the supporting infrastructure for technology-based learning is already in place. However, its utilization is not yet optimal due to several problems. These include a low level of digital literacy among teachers, the incompatibility of existing media with students' learning styles, and limited internet access during specific periods.

With the implementation of the Merdeka Curriculum, the paradigm of learning has shifted towards a more flexible, differentiated, and project-based approach (Roos & Tuerah, 2023). In this context, teachers are expected to become innovative learning facilitators, utilizing media that aligns with the needs and characteristics of their students. Technology presents a significant opportunity to create more engaging, personalized, and collaborative learning experiences, while also addressing the challenges inherent in teaching regional languages.

The proposed solution involves implementing technology-based learning media, such as Kahoot, Quizwhizzer, educational videos, and other interactive digital platforms. Previous research by Sagala et al (2021) and Alfianistiawati et al (2022) has demonstrated that the use

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of technology-based media significantly enhances students' interest, motivation, and comprehension of subject matter.

Beyond supporting diverse learning styles, technology-based media, including visual, auditory, and kinesthetic approaches, also facilitate a more efficient and adaptive learning process. The selection of these technology-driven media is further grounded in the principles of constructivism, where students actively construct knowledge through meaningful and contextual learning experiences. Learning media have a significant influence on both the learning process and its outcomes (Nida et al., 2020). Moreover, the media plays a crucial role in instilling character education values in students. Creatively designed learning media can captivate students' interest and motivate them to learn.

The use of these media simplifies the absorption of information for students. Additionally, it eases the teaching process for instructors, allowing them to deliver lessons more effectively (Putra et al., 2020). The advancement of technology has significantly impacted technology-based learning media, empowering both teachers and students to enhance their creativity in fostering a digitized learning environment. Currently, a wide array of learning media and technologies is readily available, enabling a more flexible learning atmosphere in terms of both time and space. The strategic integration of learning media also plays a vital role in increasing direct interaction between teachers and students (Pontjowulan, 2023).

This research is grounded in Arsyad's theory of media categorization, which delineates six types of media: human-based media (teachers and group activities), print media (books and work aids), visual media (pictures, graphics, and slides), audio-visual media (videos and films), and computer-based media (computer-assisted learning and interactive videos). Complementing this, Yuniarti et al (2023) further categorize technology-based learning media into three distinct types: (1) visual media, encompassing PowerPoint presentations, augmented reality (AR), and interactive applications; (2) audio media, such as language laboratories and podcasts; and (3) audio-visual media, including educational videos and Canva applications. Through these theoretical frameworks, this study seeks to elucidate the technology-based learning media employed in Javanese language instruction.

Numerous previous studies have explored the topic of technology-based learning media, often within the context of e-learning (Costaner et al., 2020). For instance, Sagala et al (2021) conducted research utilizing quiz applications like Kahoot, while Alfianistiawati et al (2022) investigated Quizwhizzer as a learning medium. Furthermore, Khodijah et al (2022) study titled "Implementation of Educational Technology in Learning at Madrasah Aliyah Negeri 2 Palembang" demonstrated that incorporating educational technology at MAN 2 Palembang helped students enhance their skills through the effective integration of learning resources into the instructional process. Technology enables more individualized, rapid, extensive, and productive teaching, while still taking into account students' cognitive abilities, environment, and characteristics. Nanda et al (2022) researched the use of educational videos to support learning. More recently, Maimanah et al (2025) in their study, "Implementation of Technology-Enhanced Learning Media Based on Technological Pedagogical and Content

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Knowledge (TPACK) to Improve Student Engagement in PAI Learning," found that TPACK-based learning media in Islamic Religious Education at SMA Wahid Hasyim 2 Taman Sidoarjo was effectively implemented, with teachers at the school already utilizing TPACK in their teaching. Similarly, Mufidah et al (2025) examined the use of Arabic language learning media in Islamic higher education, identifying the use of various media, including visual (images, slides), audio (voice recordings), audio-visual (animations, demonstrations), and interactive media (websites like Wordwall and Quizizz). Collectively, the findings from these prior studies consistently affirm that technological media can significantly boost students' interest, motivation, and learning outcomes across various educational levels.

Based on the identified gaps in existing literature, this study presents several key novelties and contributions: 1) Focused Contextual Implementation: This research investigates explicitly the Implementation of Technology-Based Learning Media in Javanese Language Learning Phase F students at the high school level. This particular topic remains significantly underexplored in the existing literature, particularly regarding the utilization of multimedia in secondary education settings within regional contexts. 2) In-Depth Qualitative Approach: Unlike many previous studies that adopted a quantitative approach, this research employs a descriptive qualitative methodology with a case study design. This involves comprehensive observation, in-depth interviews, and thorough documentation. This approach offers a broader scope for exploring data in a profound, contextual, and realistic manner, which is rarely undertaken in similar research. 3) Diverse Media Exploration: A significant portion of prior research has focused on only one specific type of technology-based learning media. This highlights a lack of studies that explore a diverse range of media within the context of Javanese language subjects, particularly for Phase F (11th grade). This study addresses that gap by examining multiple media types. 4) Underexplored Research Location: The research is conducted in a location that has not been previously studied with the same topic, providing unique insights into the specific problems and successes of implementing technology-based Javanese language instruction in this particular area.

Based on the description of the background of the problem, the researcher needs to conduct an in-depth study of the application of technology in supporting the Javanese language learning process at the high school level. The significance of this research lies in the pressing need to understand how technology can be effectively integrated into language teaching and learning. This study aims to explore the application of technology-based media in Javanese language instruction for Phase F at the high school level. Simultaneously, it will investigate the associated problematics and relevant solutions to foster the optimal utilization of technology-based Javanese language learning media.

B. Method

This study employs a qualitative approach with a case study design to analyze the problems encountered during implementation. As a type of descriptive approach, a case study involves intensive, detailed, and in-depth research on a specific organism (individual), institution, or phenomenon within a narrow scope or subject (Arikunto, 2013). This research

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specifically aims to analyze the implementation, problems, and solutions in the use of technology-based learning media in Javanese language instruction. The research was conducted at SMA Negeri 1 and SMA Negeri 2 Purbalingga, with the school principal, Javanese language teachers of 11th grade, and 11th-grade students serving as key informants. The data collection techniques utilized in this study are observation, interviews, and documentation (Sugiyono, 2013). The instruments employed include: Observation guidelines: These are in the form of a checklist that contains indicators for the planning, implementation, and evaluation of technology-based learning media; Interview guidelines: These are designed to explore the experiences of teachers, students, and the school principal in using technology-based learning media; Documentation guidelines: These are used to document supporting data for the research. The data collection process involved three stages 1) Observation: This encompassed observing learning activities, teacher training sessions, and interactions between Javanese language teachers and students, 2) Interviews: Conducted with the school principal, 11th-grade Javanese language teachers, and 11th-grade students to gather information about the problematics and the implemented solutions concerning technology-based learning media, 3) Documentation Study: This involved reviewing teacher teaching modules, which provided additional data to support the findings from observations and interviews. Data analysis, following Miles & Huberman (1984), was conducted through data reduction, data display, and conclusion drawing from the obtained data. Data reduction involved selecting data relevant to the implementation, problems, and solutions of technology-based learning media in Javanese language instruction for Phase F at SMA Negeri 1 and SMA Negeri 2 Purbalingga. Subsequently, data display was carried out by:

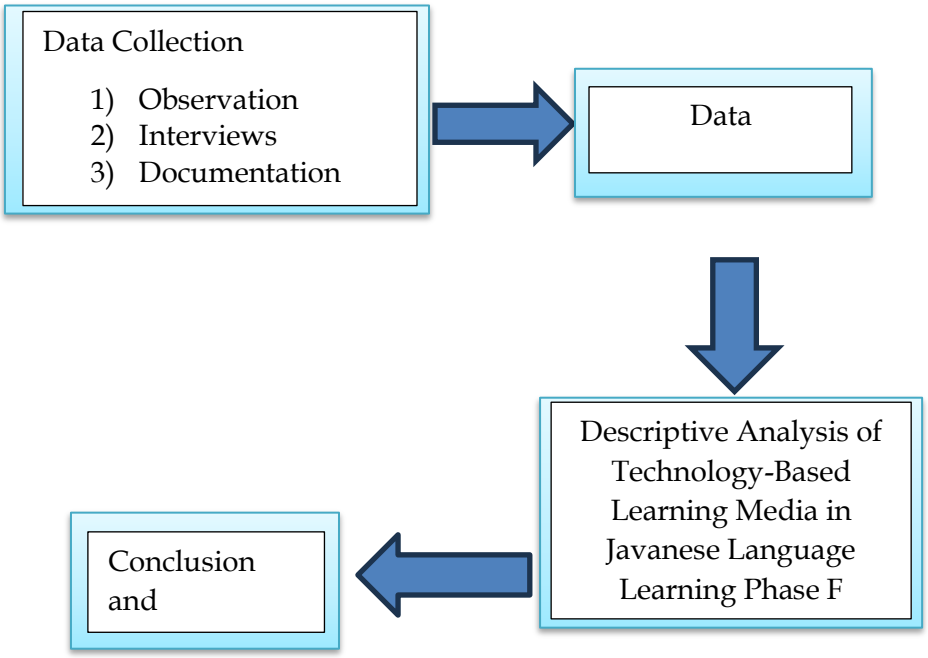

Figure 1. Data Analysis Flow

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C. Result

This study examines several key aspects concerning the Implementation of Technology-Based Learning Media in the Javanese Language Learning Phase F at SMA Negeri 1 and 2 Purbalingga. Specifically, the research focuses on three main areas: (1) the practical application of technology-based learning media in Javanese language instruction, (2) the problematics associated with technology-based learning media in Javanese language instruction, and (3) the solutions to these problematics.

1. Implementation of Technology-Based Learning Media in Javanese Language Learning Phase F

Data for this section was collected from two schools through observations, interviews, and document analysis.

Table 1. Implementation of Technology-Based Learning Media

No	Learning Phase	Form of Implementation
1.	Planning	a. Participating in In-House Training (IHT) or workshops on utilizing technology in learning b. Developing teaching modules by Javanese language teachers c. Determining learning objectives. d. Defining learning steps e. Selecting and creating learning media
2.	Implementation	a. Teachers motivate students to actively participate during technology-based learning. b. Utilizing technology-based learning media in Javanese language lessons c. Employing teaching modules in Javanese language instruction d. Grouping students based on their learning interests
3.	Conclusion/Evaluation	a. Student evaluation activities are conducted at the end of lessons, potentially in the form of assessments. b. Summative assessment activities based on indicators are carried out upon chapter completion. c. Teacher evaluation activities are conducted during learning community (Kombel) sessions.

a. Planning Phase

During the planning phase, schools actively facilitate teacher training through In-House Training (IHT) and Learning Communities (Kombel). On May 6, 2025, researchers interviewed the Head of SMA Negeri 1 Purbalingga, Mr. (JM), who stated:

https://doi.org/10.51276/edu.v6i3.1360

"Yes, we provide school-level learning communities once a month and subject-level ones weekly. In House Training (IHT) is held three times per semester. We invite external parties for training, such as technology experts and university lecturers."

Furthermore, based on an interview conducted on April 29, 2025, with Mr. (NS), the Head of SMA Negeri 2 Purbalingga, he stated:

"Yes, we provide Kombel (learning communities)/teacher learning days aimed at planning and reflecting on the use of learning media and instruction. This is conducted once a year during student holidays (early July) for refreshing."

Figure 2. Interview with the Principal of SMA Negeri 1 Purbalingga

Figure 3. Interview with the Principal of SMA Negeri 2 Purbalingga

Based on the interview results with Joko Mulyanto, Head of SMA Negeri 1 Purbalingga, and Nur Samsudin, Head of SMA Negeri 2 Purbalingga, it can be concluded that both schools provide platforms for teacher professional development through Learning

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Communities (Kombel) and In-House Training (IHT). At SMA Negeri 1, Kombel is held regularly, once a month at the school level and weekly at the subject level. At the same time, In-House Training (IHT) is conducted three times per semester, involving external resource persons such as lecturers and technology experts. These activities aim to enhance teachers' competence in developing and effectively implementing technology-based learning media.

Meanwhile, at SMA Negeri 2, Kombel is conducted annually during student holidays as a means for teachers to plan and reflect on the use of the learning media that have been implemented. Kombel serves as a discussion forum for teachers to evaluate the effectiveness of the media used and design teaching approaches that better suit students' needs. Both school heads agree that Kombel and In-House Training (IHT) are crucial in supporting technology-based learning innovation at their schools.

Javanese language teachers at SMA Negeri 1 and 2 Purbalingga, such as Ms. (RP) and Ms. (ES), develop teaching modules that incorporate the use of technology-based media and are tailored to students' learning styles. Based on an interview conducted on May 7, 2025, with Ms. (RP), a Javanese language teacher at SMA Negeri 1 Purbalingga, she stated:

> *"Before teaching, I prepare the teaching modules. All modules already utilize technology-based learning media. I also consider whether the material is suitable for technology and group students based on their learning styles (visual, like PowerPoint (PPT), auditory, like voice recordings, and audio-visual, like instructional videos and games used for assessment)."*

Additionally, on May 14, 2025, the Javanese language teacher at SMA Negeri 2 Purbalingga, Ms. (ES), added that:

> *"Yes, I create them. Every teaching module consists of the module's identity, learning outcomes (CP), and the use of learning media is written in the facilities and infrastructure section. In selecting technology-based learning media, I observe the students, and then classify their learning interests using diagnostic assessments."*

Figure 4. Interview with Javanese Language Teacher at Purbalingga 1 State High School

https://doi.org/10.51276/edu.v6i3.1360

Figure 5. Interview with Javanese Language Teacher at Purbalingga 2 State High School

Thus, based on the interviews with teachers, the planning of Javanese language instruction using technology-based learning media involves steps such as creating teaching modules that comprehensively cover all aspects, including the teaching materials to be used, the specific media to be employed, learning activities, student assessment activities, and assessment rubrics (found in the appendix of the teaching module under point D. The schools also supervise the teaching materials before they are used in instruction and provide feedback through initial observation activities.

b. Implementation Phase

During the implementation phase, teachers create an interactive and motivating learning environment. On May 7, 2025, an interview with Ms. (RP), a Javanese language teacher at SMA Negeri 1 Purbalingga, revealed:

"*We interact by asking students to answer questions.*"

On May 14, 2025, Ms. (ES), a Javanese language teacher at SMA Negeri 2 Purbalingga, further emphasized the importance of classroom agreements and personal rapport:

"*We always remind them by creating agreements and building closeness with the students.*"

From the statements of both Javanese language teachers at SMA Negeri 1 and 2 Purbalingga, it can be concluded that teachers play a significant role in motivating the learning process. They foster a dynamic and collaborative atmosphere by actively engaging students and offering incentives to encourage more active participation in the learning process. Furthermore, teachers establish *agreements* that serve as clear guidelines for students regarding learning objectives and rules. They also emphasize the importance of building strong relationships with students to create a comfortable and familiar learning environment.

https://doi.org/10.51276/edu.v6i3.1360

Based on interviews and observations with Ms. (RP) on May 7, 2025, she stated that:

> "*I usually use Quizizz, Canva, PowerPoint (PPT), Kahoot, and instructional videos from YouTube. For manual learning media, I use books.*"

Similarly, based on interviews and observations with Ms. (ES), a Javanese language teacher at SMA Negeri 2 Purbalingga, the frequently used media include:

> "*Commonly used technology-based learning media are PowerPoint (PPT) for delivering material, Kahoot, Quizizz, Wordwall, and instructional videos (YouTube links). For manual media, we use textbooks, whiteboards, and notebooks.*"

Figure 6. Use of *PowerPoint* (PPT) Media

Figure 7. Use of Wordwall

Figure 8. Use of *PowerPoint* (PPT) media

Figure 9. Use of Quizizz

Observations conducted on May 20 and 21, 2025, revealed that the learning media used at SMA Negeri 1 and 2 Purbalingga included PowerPoint (PPT), instructional videos, Wordwall, Kahoot, and Quizizz, supported by devices such as laptops, projectors, speakers, and classroom Wi-Fi access. Teachers also leverage manual media, such as textbooks, whiteboards, and student notes, to combine traditional and digital methods, aiming for a more comprehensive learning experience.

https://doi.org/10.51276/edu.v6i3.1360

c. Evaluation Phase

Evaluation activities are an integral part of the learning process. These evaluations are conducted to monitor student progress during teaching and learning activities at school. Below is an interview session with Ms. (RP) on May 7, 2025, concerning the evaluation activities applied in Javanese language learning using technology-based learning media:

> "*Typically, I use Quizizz for formative assessments/reflections and e-learning for summative assessments*"

On May 14, 2025, an interview with Ms. (ES), a Javanese language teacher at SMA Negeri 2 Purbalingga, stated that:

> "*Yes, I usually use Quizizz, Kahoot, and Canva for Javanese script assessments by creating puzzles. For summative assessments, I often use Google Forms, depending on the material. If the material allows, I use Google Forms; otherwise, I use paper*."

Based on the interview results with Javanese language teachers from SMA Negeri 1 and 2 Purbalingga, it can be concluded that the assessments conducted by teachers for students utilize technology-based learning media such as Quizizz, Kahoot, e-learning, and Google Forms. This approach aims to simplify the grading process for teachers and provide convenience for students.

Evaluation is not only directed at students but also at teachers through weekly learning community (Kombel) activities, which serve as a forum for reflection and professional development for teachers.

2. Problems in Implementing Technology-Based Learning Media in Javanese Language Instruction

Based on interviews and observations conducted by the researchers with school principals, Javanese language teachers, and eleventh-grade students, several issues concerning the implementation of technology-based learning media in Javanese language instruction were identified.

Table 2. Problematics of Technology-Based Learning Media

Implementation of Technology-Based Learning Media	Problematics
- The use of technology-based learning media is repetitive/lacks variety	- Student Engagement & Perception, Students perceive the media as lacking innovation - Student Engagement, Students feel the media is not innovative enough

https://doi.org/10.51276/edu.v6i3.1360

Implementation of Technology-Based Learning Media	Problematics
- Material is still considered difficult despite the use of technology	- Students still feel bored despite the use of technology
- Issues with the use of applications such as Kahoot (technical glitches, connectivity).	- Digital Literacy: Students are unfamiliar with or struggle to use new media they have not encountered before.
- The application unexpectedly closes during assessments	- Technical Issues, Unstable internet connection

Despite the implementation of technology-based learning media, several problems persist:

a. Suboptimal Implementation of Technology-Based Learning Media in Javanese Language Instruction

Based on an interview conducted on May 7, 2025, with Ms. (RP), a Javanese language teacher at SMA Negeri 1 Purbalingga, she stated:

> "*The use of technology-based learning media in Javanese language instruction hasn't been optimal, not fully aligning with the plans and teaching modules. This is due to students' delays in completing assignments (LKPD) and teachers having insufficient preparation time because of heavy workloads.*"

According to her statement, teachers have not yet fully implemented technology-based learning media. This is attributed to students' tardiness in completing tasks and teachers feeling overwhelmed with numerous responsibilities, which hinders their optimal preparation of technology-based learning media.

Furthermore, in an interview on May 14, 2025, Ms. (ES), a Javanese language teacher at SMA Negeri 2 Purbalingga, explained:

> "*In implementing technology-based learning media, there are certainly problems, especially regarding its suboptimal execution. This is because of low student enthusiasm and my already heavy workload as a teacher, which sometimes makes me too exhausted to develop new learning media.*"

Based on this statement, the implementation of technology-based learning media is not maximized due to a lack of student enthusiasm. From the teachers' perspective, having other duties prevents them from creating innovative technology-based learning media.

https://doi.org/10.51276/edu.v6i3.1360

b. Lack of Engaging Technology-Based Media Development

The role of technology-based learning media in supporting instruction is crucial, as it benefits both teachers in delivering material and students in comprehending it while fostering enjoyment. In an interview on May 14, 2025, Ms. (ES) stated:

> "*Developing technology-based learning media isn't difficult; it's just that teachers feel reluctant to create innovative ones. The media most frequently used for delivering material is merely PowerPoint (PPT), with Quizizz and Kahoot for assessment. This leads me to continue using basic technology-based learning media.*"

This statement indicates that while creating technology-based learning media is not inherently problematic, the teachers' reluctance to develop diverse and innovative options is a significant factor. Consequently, teachers tend to reuse media they have previously employed in their lessons.

c. Unstable Internet Connection

Figure 10. Interview of Students of SMA Negeri 1 Purbalingga

Figure 11. Interview of Students of SMA Negeri 2 Purbalingga

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Based on interviews with students at SMA Negeri 1 and 2 Purbalingga, they reported that the schools provide Wi-Fi for students to access technology-based learning. However, this encounters technical issues, particularly regarding the Wi-Fi network. Students find it challenging to access technology-based learning media because the school's Wi-Fi network is slow. When teachers ask students to access platforms like Moodle, Quizizz, or Kahoot, it takes a considerable amount of time for the pages to load. Students often have to wait for a stable connection to open these platforms. This situation results in inefficient learning time, as students spend more time waiting for content to load than engaging with the material.

3. Solutions for Problems in Technology-Based Learning Media in Javanese Language Instruction

Beyond the issues outlined above, several solutions can be employed by students and Javanese language teachers to overcome obstacles in the planning, implementation, and evaluation phases. The following are some solutions utilized by Javanese language teachers, students, and schools to address problems related to technology-based learning media in Javanese language instruction:

Table 3. Solutions to Technology-Based Learning Media Problems

Problematics of Technology-Based Learning Media	Solutions to Problematics
- Student Engagement & Perception, Students perceive the media as lacking innovation	- The school provides In-House Training (IHT) and Learning Communities (Kombel), where teachers receive training and education on learning media.
- Students still feel bored despite the use of technology	- Personalized Learning, Teachers classify students' learning styles according to their interests to enhance student engagement and enjoyment in learning.
- Digital Literacy, Students are unfamiliar with or struggle with new media they have not used before	- Guidance and Instruction, Teachers provide detailed guidance to students on how to use the features of various media.
- Technical Issues, Unstable internet connection	- The school has already provided Wi-Fi in every classroom, enabling students to access technology-based learning materials.
- Student Response: A neutral or indifferent response from some students.	- Innovation Encouragement: Teachers are a Problematic Factor in Creating Innovative and Diverse Learning Media.

a. School Provides In-House Training (IHT)

To enhance the competence and professionalism of educators, schools actively provide In-House Training (IHT) as a platform for teacher development and capacity building. These activities are designed to enhance the quality of instruction and promote a more effective and innovative educational environment.

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b. Teachers Classify Learning Styles

Based on interviews with Rina Purwasih and Endah, both Javanese language teachers stated that they classify students based on their different learning styles. These two teachers categorize students into various learning styles, including visual, auditory, and audio-visual. This approach aims to help students better understand the material and engage more enthusiastically in Javanese language learning. This can create a more effective and enjoyable learning environment, which will positively impact student learning outcomes.

c. Teachers Provide Student Guidance

Observations conducted on May 21, 2025, at SMA Negeri 1 Purbalingga and May 20, 2025, at SMA Negeri 2 Purbalingga revealed that before learning activities, teachers explained classroom agreements, the material to be learned, and the use of mobile phones in class. During the implementation of technology-based learning media, such as Kahoot and e-learning at SMA Negeri 1, and Quizizz at SMA Negeri 2 Purbalingga, teachers provided detailed instructions on how to access these platforms. Due to the teachers' clear explanations, students demonstrated a significantly improved understanding of how to operate these platforms.

d. The School Provides Wi-Fi

Based on observations, the school has provided Wi-Fi, which is highly beneficial for supporting learning activities. The availability of internet access enables students to utilize various technology-based learning media more effectively. With Wi-Fi, students can access materials and conduct necessary research for their assignments. Furthermore, this network supports collaboration among students through digital platforms, thereby enhancing learning interaction. Therefore, providing Wi-Fi in schools is crucial for creating a more modern and interactive learning environment.

e. Challenging Teachers

Based on an interview with Mr. (JM), the Head of SMA Negeri 1 Purbalingga, he emphasized that teachers must continue to utilize technology-based learning media. These learning media need to be innovative to capture students' attention. Mr. (JM) believes that leveraging technology can enhance the effectiveness of teaching and learning. This aligns with the opinion of Mr. (NS), the Head of SMA Negeri 2 Purbalingga, who also highlighted the importance of creativity in teaching. According to him, teachers should continually try new things and avoid relying on repetitive methods. Both principals agree that innovation in education is essential to meet contemporary problems.

Mr. (JM) and Mr. (NS) also emphasized the importance of training teachers to effectively utilize technology. This will help teachers discover new ways to deliver learning materials. Consequently, students will be more motivated and active in the learning process. This initiative is expected to foster a more dynamic and enjoyable educational environment.

https://doi.org/10.51276/edu.v6i3.1360

D. Discussion

The findings of this study reveal that the Implementation of Technology-Based Learning Media in the Javanese Language Learning Phase F at SMA Negeri 1 and 2 Purbalingga has been executed with a structured approach. Broadly, this discussion focuses on three main aspects: the implementation, problems, and solutions related to technology-based learning media.

Firstly, the application of technology-based learning media was carried out through planning, implementation, and evaluation stages. Teachers meticulously prepared teaching modules, incorporating various media such as PowerPoint, Canva, instructional videos from YouTube, Quizizz, and Kahoot. This finding corroborates the perspective of Sagala et al (2021). Furthermore, Nanda et al (2022) state that technology-based media are capable of enhancing student motivation and engagement.

Secondly, several problems emerged during implementation, including limited internet access, a lack of variety in the media utilized, and inconsistent digital literacy among teachers. According to Khodijah et al (2022), these obstacles align with the results of their study, which indicate that technology integration necessitates robust infrastructure and human resource readiness. Teachers also experienced fatigue due to high workloads, leaving them with insufficient time and energy to develop new media. Wijaya et al (2021) further assert that the successful integration of technology-based media requires teachers' mental preparedness and well-managed workloads.

Thirdly, solutions to these problems have been pursued by the schools, notably through the implementation of In-House Training (IHT) and Learning Communities (Kombel) as platforms for teachers' professional development. Hidayat et al (2021) emphasize that teacher training is a crucial factor in the effectiveness of technology-based learning.

Another key finding indicates that teachers are also beginning to apply principles of differentiated instruction by classifying students' learning styles. This strategy is highly relevant to the Merdeka Curriculum approach, which prioritizes personalized and project-based learning.

Overall, this research reinforces the view that technology-based learning media can be an effective means of enhancing the quality of Javanese language learning, provided that teacher readiness, adequate facilities, and continuous training support are in place. Thus, the integration of technology in local language instruction not only supports the achievement of learning objectives but also contributes to cultural preservation through an approach more relevant to the current digital generation.

E. Implication

Theoretically, this research aims to expand the body of knowledge within the field of Javanese language learning, particularly regarding the implementation of technology-based learning media in Javanese language instruction at schools. Furthermore, this study serves as a valuable source of information and a reference for other researchers who intend to

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investigate issues related to the implementation of technology-based learning media in Javanese language education. Additionally, technology-based learning media can serve as an educational resource, providing information and insights into learning technology in Javanese language instruction. The practical implications of this research encourage schools to conduct regular training sessions and establish teams dedicated to developing technology-based media, ensuring more effective learning implementation.

F. Limitations and Suggestions for Further Research

The limitations of this study lie in its restricted scope, as it was conducted in only two schools and focused solely on eleventh-grade students. Consequently, it may not fully represent the diverse conditions and characteristics of other schools, whether in terms of geography, facilities, or student backgrounds. Furthermore, this research did not quantitatively test the effectiveness of technology-based learning media, thus precluding a comprehensive understanding of how significantly the media improved student learning outcomes. For future research, we recommend expanding the scope to include more schools and grade levels. Involving a wider range of schools from diverse areas, including both urban and rural settings, would yield more representative results. Additionally, the development of more interactive and adaptive technology-based learning media is highly recommended, especially media accessible to all students regardless of device limitations or internet connectivity. Subsequent research could also integrate a quantitative approach to empirically measure the effectiveness of media use, thereby providing a stronger foundation for the application of technology in Javanese language learning.

G. Conclusion

Based on the research findings concerning the "Implementation of Technology-Based Learning Media in Javanese Language Learning Phase F," the following conclusions can be drawn: 1) The application of technology-based learning media in Javanese language instruction for 11th-grade students at SMA Negeri 1 and 2 Purbalingga has been implemented. This process begins with teachers' preparation, including the creation of teaching modules that cover facilities, infrastructure, and learning activities. Subsequently, various technological media such as PowerPoint (PPT), instructional videos, Quizizz, Kahoot, and LMS are utilized to enhance student interaction and comprehension of the taught material, 2) Problematics in implementing technology-based learning media in Javanese language instruction at 11th-grade SMA Negeri 1 and 2 Purbalingga primarily stem from the suboptimal execution of the implemented media. Key issues include the limited variety of technology-based learning media used and unstable internet connections, which hinder access to these resources, 3) Solutions to address the problematics in implementing technology-based learning media in Javanese language instruction at SMA Negeri 1 and 2 Purbalingga include: 1) the schools providing In-House Training (IHT) and collaborative community (kombel) discussion sessions for educators to share experiences regarding

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technology-based learning media; 2) teachers classifying students' learning styles; 3) teachers providing clear directions during the use of technology-based learning media; 4) schools providing adequate facilities and infrastructure to support learning activities using technology-based media; and 5) encouraging teachers to utilize innovative learning media.

Furthermore, recommendations are directed to Javanese language teachers, urging them to enhance their creativity in using technology-based learning media and to improve time management for media development. All members of the SMA Negeri 1 and 2 Purbalingga community are encouraged to be more involved in and supportive of all implemented programs, especially concerning the adoption of technology-based learning media. It is hoped that the schools will make improvements in implementing technology-based learning media, recognizing that such issues require specific training and guidance to achieve optimal results. For future researchers intending to conduct similar studies, this research can serve as a benchmark for broader development.

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Author's Biography

Sabrina Zalfa Ociana, S.Pd. was born in Purbalingga city on July 26, 2003. Student at Universitas Negeri Semarang (UNNES). Bachelor's degree in Javanese Language and Literature Education at UNNES.
Email: sabrina07ociana@students.unnes.ac.id

Dr. Agus Yuwono, M.Pd. Born in Ngawi, December 15, 1968. Obtained a Bachelor's degree in Javanese Language and Literature Education; in 1992, a Master's degree from Semarang State University, Indonesian Language Education in 2008, and a Doctorate in Language Education from the same university in 2020, Lecturer in Javanese Language and Literature Education, Faculty of Languages and Arts, Semarang State University, Also as the Head of the PPG Study Program in 2023, Semarang State University, Expertise in Language and Culture Education.
Email: agusyuwono@mail.unnes.ac.id