Al-Ishlah: Jurnal Pendidikan
Vol.17, 2 (June, 2023), pp. 3452-3463
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v17i2.6873

Digital Media Preferences for Differentiated Learning: A Study of PowerPoint and Video Use in the Merdeka Curriculum

Maharani Putri Kumalasani[1], Beti Istanti Suwandayani[2], Renanda Ajeng Pramusti[3]

[1] Universitas Muhammadiyah Malang, Indonesia; maharani@umm.ac.id
[2] Universitas Muhammadiyah Malang, Indonesia; beti@umm.ac.id
[3] Universitas Muhammadiyah Malang, Indonesia; ajengp2003@gmai.com

ARTICLE INFO

Keywords:

media;
preferences;
powerpoint;
video;
differentiated

Article history:

Received 2025-01-09
Revised 2025-03-02
Accepted 2025-06-30

ABSTRACT

The independent curriculum demands that teachers accommodate students' diverse learning characteristics. Differentiated learning provides a framework for meeting these varied needs, with the effective use of instructional media playing a crucial role. PowerPoint presentations and videos are frequently chosen by teachers to support differentiated learning due to their adaptability and broad accessibility. This qualitative descriptive study explores teachers' preferences in selecting PowerPoint and video as instructional media for differentiated learning. Data were collected through interviews, observations, questionnaires, and documentation. The data analysis process involved four stages: data collection, data reduction, data display, and conclusion drawing. Findings indicate that teachers prefer PowerPoint and video media based on several key factors: alignment with learning objectives, compatibility with student characteristics, ease of use, interactivity, effectiveness in content delivery, accessibility, flexibility, cost-efficiency, and compatibility with available technology and infrastructure. The study reveals that both media types are valued for their ability to enhance differentiated instruction by addressing diverse student needs. However, the choice of media is significantly influenced by contextual factors such as school infrastructure and teacher familiarity with technology. This study concludes that teachers consider a range of practical and pedagogical factors when selecting PowerPoint and video media to support differentiated learning. Future research should explore the impact of these media on student learning outcomes.

Corresponding Author:
Maharani Putri Kumalasani
Universitas Muhammadiyah Malang, Indonesia; maharani@umm.ac.id

1. INTRODUCTION

Differentiated learning at the primary school level is fundamental to the implementation of the Merdeka Curriculum in Indonesia, which provides freedom and flexibility in the learning process (Hidayat, Basthomi, & Afrilyasanti, 2024).This approach tailors the teaching process to the individual characteristics, needs, demands, and abilities of learners. At the primary school level, differentiated learning is an important strategy for determining that each learner gets a learning experience that suits

their unique profile so that they can reach their maximum potential (Tri et al., 2023). This approach allows teachers to prepare and customize learning materials, methods, and assessments according to their needs, interests, characteristics, and abilities (Gheyssens et al., 2022). This differentiated learning can create a diverse classroom and provide opportunities for learners to reach content, process ideas, and improve learning outcomes so that they can learn more effectively according to their potential (Qorib, 2024). Research results (Theobald, 2021)show that the application of differentiated learning has a positive impact on the creativity and learning achievement of students. This explains that learning strategies tailored to the individual characteristics of students can improve the quality of learning in elementary schools.

The implementation of differentiated learning that can have a positive impact is supported by the role of learning media as an important tool to maximize the learning process (Y. Sun et al., 2024). By utilizing various learning media, teachers can present learning materials according to the learning styles, interests, and abilities of students. The learning process that utilizes varied learning media can increase students' motivation and learning outcomes in differentiated learning (Z. Sun et al., 2024). Research results (Sondakh, 2021) show that integrating learning media that suit the needs of students can increase students' engagement and understanding of the material being taught.

Media integration in differentiated learning requires teachers' ability to determine and select learning media that suit the needs of students and the learning materials to be taught (Wang & Kumar, 2024). Teachers' preferences in choosing learning media are influenced by several factors, including ease of use, availability of resources, and perceptions of the effectiveness of the learning media (Lawrence & Tar, 2018). The Merdeka curriculum calls for integrating information technology to improve the effectiveness of the learning process (Mufanti, Carter, & England, 2024). This emphasizes that teachers must have creativity and broad insight in determining learning media that suit the needs of students. The demands of the Merdeka curriculum, which call for the integration of information technology in the learning process, make teachers choose digital learning media, namely PowerPoint and learning videos (Arochman & Fortinasari, 2024).

Digital learning media such as PowerPoint and Video have become important components in modern education, especially in supporting differentiated learning in primary schools. The use of PowerPoint allows teachers to present material and information in a structured manner that can be adapted to the learning styles and abilities of learners (Jurnal et al., 2022). PowerPoint has long been used as a presentation tool in education. Features such as animation, graphics, and images allow the delivery of material visually which can increase learner understanding. PowerPoint, which is made interactive by teachers, can improve the professional competence and learning motivation of students. In addition, the digital learning media chosen by teachers is video media, because videos can convey complex concepts through visualization and audio, offering a more dynamic and interesting learning experience (Huang & Xia, 2024). Video media offers advantages in demonstrating processes, telling stories, or presenting real situations relevant to the subject matter (Heidari et al., 2020). Videos can overcome the limitations of learners' direct experience by presenting situations or phenomena that they cannot experience directly (Jiang et al., 2024). Research results from (Wu, Liao, Tsai, & Kwok, 2024) show that the use of videos in learning can increase students' motivation and understanding of the material being taught. The combination of PowerPoint and video learning media allows teachers to meet the learning needs of learners both individually and in groups, thus creating a more inclusive and effective learning environment.

While the integration of digital media in the learning process offers various benefits, its implementation cannot be separated from the challenges faced (Eti et al., 2024). Not all teachers can master PowerPoint and video in the learning process. Teachers also face limitations in technical skills and access to the necessary technology. Many teachers are not accustomed to or trained in utilizing technology effectively in the learning process. Adequate support, including ongoing training and training resources, is needed to ensure that teachers can develop digital skills such as integrating PowerPoint and video effectively in learning (Abedi, 2024). In addition, limited internet access is one of the obstacles to implementing technology in elementary schools. This is important to note because in the learning process

involving technology, Power point and video are the media of choice for most teachers to assist in learning. Because each learner has a different learning style, there is a tendency to capture learning material. With the integration of technology in the learning process, teachers can face the challenges of implementing modern learning while still paying attention to the diversity of learner characteristics.

Learners' learning style preferences have tendencies such as auditory, visual, and kinesthetic. Each learning style tends to have learners' understanding of the material presented that they quickly capture through different displays (Yang & Miang Goh, 2022). With different learning styles owned by learners, teachers need to consider variations in choosing learning media to ensure the material can be accessed and understood by all learners (El-Sabagh, 2021). Power points and learning videos are often chosen by teachers to facilitate differentiated learning in primary schools. For this reason, teachers have a preference for using points and learning videos are often used in the learning process to facilitate learners with different characteristics in differentiated learning (Zhao et al., 2021).

Research that has been done provides information on the use of learning media in one of the subjects that can improve student learning outcomes, but the preferences that underlie teachers in choosing differentiated learning media have not been reviewed in previous studies. For this reason, this research is important to provide information that learning media that are often used by teachers to support differentiated learning are PowerPoint and learning videos that can be integrated into one learning media that supports each other as digital learning media.

The purpose of this research is to investigate the preferences of elementary school teachers in selecting PowerPoint presentations and video-based media as tools for implementing differentiated learning strategies within the framework of the Merdeka Curriculum. By identifying specific factors influencing these preferences, such as ease of use, engagement, effectiveness in addressing diverse student needs, and alignment with curricular goals, the study aims to provide evidence-based insights into the integration of digital media in elementary education. The contribution of this research lies in its potential to guide policymakers, curriculum developers, and educational practitioners in enhancing the effectiveness of differentiated instruction. By understanding the preferences and challenges faced by teachers, the study will help improve professional development programs, inform the design of user-friendly teaching resources, and support the creation of media that caters to the diverse learning needs of students. Additionally, it contributes to the academic discourse on technology-enhanced education by offering a contextualized analysis of media utilization in the Merdeka Curriculum.

2. METHODS

2.1 Research Design

The research conducted used a qualitative approach and descriptive method. This method and approach are used to provide a real and complete picture related to certain aspects of everyday life. In this case, the pretensions of teachers in choosing PowerPoint and video as differentiated learning media. The analysis used in this research is based on Miles and Huberman's data analysis. This descriptive qualitative research aims to analyze teacher preferences in choosing PowerPoint and video as differentiated learning media in elementary schools.

2.2 Research Subject

The subject of this research is teachers who implement differentiated learning in elementary schools in Malang City. The sample in this study was 30 Malang City elementary school teachers with qualifications as teacher facilitators and who have passed the Teacher Professional Education as subjects who have a preferences for PowerPoint and learning videos. The selected subjects have filled out the willingness forms as subjects of this research. The preference for selecting PowerPoint and videos is analyzed based on the characteristics of PowerPoint and videos, the learning styles of students, and differentiated learning methods.

2.3 Research Variables and Instruments

This study uses 3 variables, namely, preferences, PowerPoint, and video media, and differentiated learning methods. This research focuses on these 3 things as a reference for further analysis. The research instruments used are interview sheets, observation, questionnaires, and documentation.

2.4 Procedure and data analysis

This research procedure is carried out by collecting data from interviews, observations, and questionnaires with teachers regarding preferences for choosing PowerPoint and videos in differentiated learning. The interview process and questionnaires were conducted in a semi-structured manner with open-ended questions, which gave the research subjects the opportunity to provide more information. Then, collecting data by taking documentation about the utilization of power points and videos in the differentiated learning process. The steps of Miles & Huberman's data analysis (Asipi et al., n.d.)are as follows:

1. Data Collection
   The first step in this research is to start by collecting data as initial material which will be processed at the next stage of research. Data collection is obtained using various techniques, namely interviews, observations, questionnaires, and documentation.
2. Data Reduction
   The next stage is data reduction, which is summarizing the data that has been collected. Selecting the main data, focusing on the main and important data, looking for patterns and themes, and then setting aside the data that is not used. Data reduction activities will provide a clear picture to researchers and facilitate research in collecting further data.
3. Data Display
   The next stage is presenting data or data display. Presenting data in qualitative research can be done by making brief descriptions, charts, relationships between categories, and the like. This stage will make it easier for researchers to understand what is happening from the data that has been reduced.
4. Drawing Conclusions
   The next step is drawing conclusions and verification after going through the data presentation stage. In this conclusion, the researcher provides conclusions related to teacher preferences in choosing PowerPoint and video as differentiated learning media to answer the problem formulation that has been determined by the researcher.

3. FINDINGS AND DISCUSSION

The findings of the research regarding teachers' preferences in selecting PowerPoint presentations and video media for use in differentiated learning are presented in the table below. These results highlight how educators tailor their instructional methods to meet diverse student needs. The data offers insights into the frequency, purpose, and perceived effectiveness of each media type in various teaching contexts. Understanding these preferences helps inform future professional development initiatives and resource allocation to support more personalized and engaging learning experiences.

Table 1. Data Analysis of Preferences in PowerPoint and Video Media in Differentiated Learning

No	Aspects	PowerPoint	Video
1	Media Considerations	a. The learning objectives achieved b. Characteristics of learners with different abilities and audio, visual, and kinesthetic learning styles c. Used to introduce concepts and motivate learners d. Quality of material collected from several references or books	a. By the specified learning objectives b. Characteristics of learners with different abilities and audio, visual, and kinesthetic learning styles c. Used to elaborate on material and motivate students d. Better quality and contextualized materials.
2	Media Features	a. Ease of Use b. Material Visualization c. Hyperlink d. Animations and Transitions e. Media Integration f. Compatibility and Portability g. Time Saver Feature h. Presentation Mode	a. Interactivity b. Pause and Replay c. Narrative Text d. Varied Duration e. Easy Video Insertion f. Video Creation of Presentation g. Streaming Capacity
3	Role of Media	a. Improving Learning Interactivity b. Supports diverse learning styles c. Increase learner motivation and interest d. Facilitate easier and more effective delivery of material e. Create a fun and interactive learning environment	a. Increase students' motivation and interest in learning b. Provide innovative learning materials c. Facilitate more interactive learning d. Accommodates diverse learning styles e. Support the implementation of differentiated learning
4	Types of Differentiation	a. Content Differentiation b. Process Differentiation c. Product Differentiation	a. Content Differentiation b. Process Differentiation c. Product Differentiation

	Preferences
1	Appropriateness to Learning Objectives
2	Suitability to the Characteristics of Learners
3	Practicality of Use
4	Interactivity
5	Effectiveness in Material Delivery
6	Availability and Accessibility
7	Flexibility and Adaptability
8	Cost
9	Technology and Infrastructure

Based on data mapping gathered from teachers, their preferences in selecting PowerPoint presentations and video media for differentiated learning can be explained as follows:

Teachers choose PowerPoint and video media by carefully considering the learning objectives and the diverse characteristics of their students. These include variations in ability levels and learning

styles—such as auditory, visual, and kinesthetic preferences (Rawashdeh, 2021). Teachers use PowerPoint primarily to introduce new concepts and to motivate learners. PowerPoint presentations allow for comprehensive material coverage, as educators often integrate information from various references and supporting textbooks to enhance the depth of their explanations (Out, n.d.).

In contrast, videos are typically employed to elaborate on concepts and foster deeper understanding. They help engage students by providing audiovisual content that supports retention and motivation. Videos can stimulate critical thinking and present contextualized, real-life examples that may not be easily demonstrated in the classroom environment (Ribosa & Duran, 2023; Deng & Gao, 2023). As such, videos serve as effective tools for reinforcing content and enhancing student engagement.

A significant factor influencing teachers' selection of PowerPoint and video media lies in the specific features each platform offers. PowerPoint is valued for its ease of use, allowing educators to create visually engaging presentations without requiring advanced design skills. Ready-to-use templates expedite content creation, while the visualization features—such as charts, diagrams, and tables—support clearer concept delivery (León & García-Martínez, 2021).

Additional tools such as hyperlinks for efficient navigation, animation and transition effects to capture attention, and media integration features (videos, audio, quizzes) allow teachers to cater to varied learning preferences (Mohapatra & Zayapragassarazan, 2021). PowerPoint also offers device compatibility, allowing presentations to be shared across laptops, tablets, and smartphones. The video export option reduces production costs by enabling seamless distribution of materials (Xu et al., 2023). Features like slide reuse, master slides, and presentation view mode also contribute to consistent and efficient lesson planning.

Video media offers its own advantages. Interactive videos with embedded quizzes and instructions enhance learner engagement and promote active participation (Mirriahi et al., 2021). Videos can be paused, replayed, or revisited at specific sections to reinforce comprehension, with teacher guidance adding clarity where needed. Additionally, videos that combine visuals, audio, and on-screen text can accommodate students who struggle with focus or auditory processing.

Teachers also appreciate the flexibility in video duration, allowing them to select videos that match the attention span and comprehension level of their students (Henderson & Schroeder, 2021). However, videos that are too lengthy may reduce engagement, so careful selection is crucial. Videos can be easily embedded into PowerPoint presentations or created from existing teaching materials, providing a cost-effective and scalable solution for content delivery. Platforms like YouTube allow videos to be stored and replayed when needed, further enhancing accessibility.

With these preferences in mind, the following graph presents a visual representation of the digital media most frequently used by teachers in differentiated learning environments.

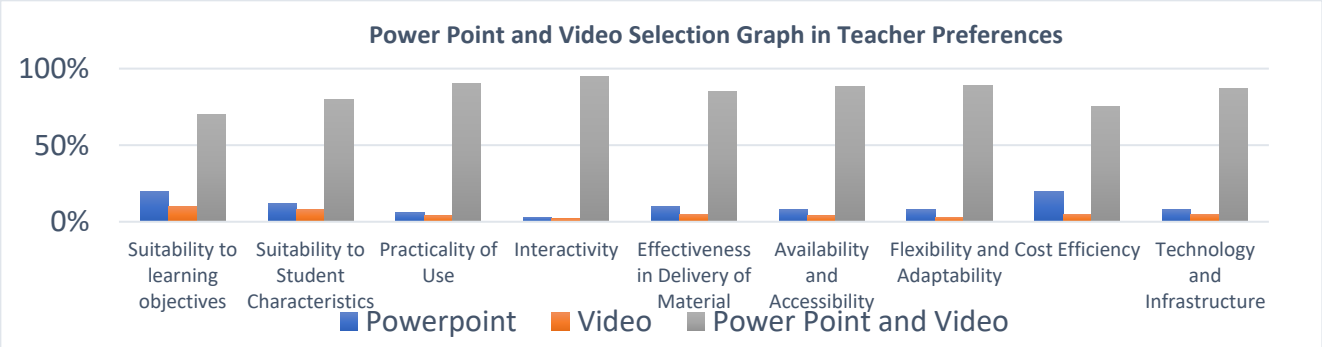

Figure 1. PowerPoint and Video selection in teacher preferences

The percentage in the graph above can explain that collaboration between PowerPoint and Video in the implementation of differentiated learning is more chosen than using only one of PowerPoint and

Video. In the graph, in can be seen that teacher's preferences in choosing power points and learning videos cinsider the aspects of the media. Teachers choose to integrate the two media in one unit of media that is implemented in differentiated learning. Features provided by PowerPoint and video, the role of the two media teachers such as power points and video can facilitate diverse learning styles of learners, with the presentation of visualizations, narrative text, audio, quizzes, instructions, animations, images, and video displays that represent the contextualization of learning materials (Tadele Kahsay et al., 2024). Power points and videos can increase the motivation and interest of students with curiosity after being presented with power points and videos that are presented innovatively, students will ask a lot of questions, be interactive, and get additional knowledge insights that can be collaborated with the books they have read, so that the learning atmosphere becomes fun and interactive which can support differentiated learning (Alhamuddin et al., 2023;Johler & Krumsvik, 2024).

Power points and learning videos can be presented in differentiated learning where teachers facilitate the diverse characteristics of students to learn according to their needs and abilities (Elitzur, Katz, Muttath, & Soberman, 2024). There are 3 types of differentiation delivered by teachers, including content differentiation, where teachers adjust the material or topics taught according to the ability level of students (Bardy et al., 2021). PowerPoints were made by teachers, with each slide made with a simple summary for learners who have a basic level of understanding, slides with more in-depth explanations for learners who have higher abilities, and hyperlinks in slides that direct learners to additional sources for further exploration. Videos that can be presented in content-differentiated learning, teachers choose videos with short duration and simple language for learners with a basic understanding, and additional videos with more in-depth delivery can help higher-level learners' understanding (Ziegler et al., 2024).

Differentiated learning by process means that teachers modify how learners learn to understand material organized in learning models and methods (Smets et al., 2022). Power point in process differentiated learning is presented by teachers making interactive slides such as quizzes or questions for discussion, and stages of activities that students can do directly. Meanwhile, videos can be presented with a display related to procedures, so that learners are asked to imitate what is in the video gradually.

Differentiated learning by-product means that teachers provide flexibility to learners in the way they demonstrate their understanding or learning outcomes (Grecu, 2023). PowerPoint in product differentiated learning can be presented with slides made by the teacher presenting various examples of alternative tasks that can be made by learners, such as posters, presentations, summaries, diagrams, simulations, and role-playing, according to the tasks and materials studied (Chang, Zhou, & Zhang, 2024). Videos can be presented in product-differentiated learning by showing how students complete tasks in a variety of ways, with students listening to the video, the teacher asks students to complete tasks in a variety of ways, products, and results by the learning objectives that have been set (Park et al., 2022). The following is a diagram of the results of interviews, observations, and documentation of elementary school teachers in Malang City in differentiated learning using content, process, and product:

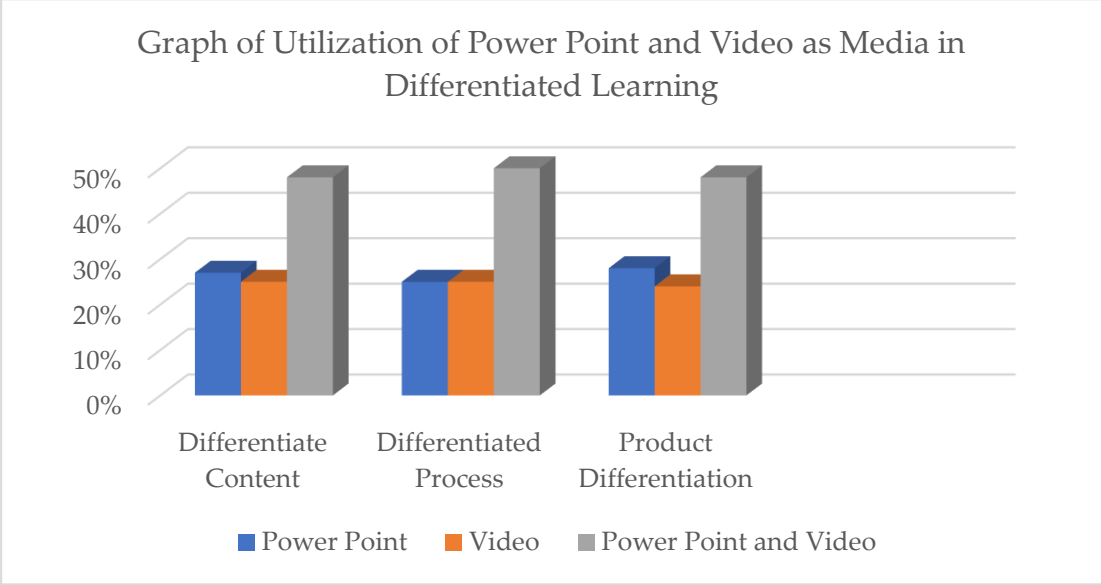

Figure 2. Utilization of PowerPoint and Video as Differentiated Learning Media

Figure 1 illustrates the implementation of differentiated learning through three main approaches: differentiated content, process, and product. The graph reflects the preferences of elementary school teachers in Malang City regarding the use of PowerPoint and video media for each approach.

In content-differentiated learning, 27% of teachers use only PowerPoint, 25% use video, and 48% utilize a combination of both. In process-differentiated learning, 25% use PowerPoint, 25% use video, and 50% use both media. For product-differentiated learning, 28% use PowerPoint, 24% use video, and 48% use both. Across all three categories, the highest percentage consistently involves the integration of both PowerPoint and video, indicating a clear preference among teachers for combining these tools in differentiated instruction.

The integration of PowerPoint with video enhances instructional delivery by creating a more dynamic, interactive, and engaging learning experience. Teachers often embed videos directly into PowerPoint presentations, allowing seamless access to both resources during classroom instruction (Draijer, 2020). This integration supports a multimodal approach, which increases student motivation and helps achieve learning objectives more effectively.

Despite these benefits, teachers also report challenges. For example, technical issues may prevent embedded videos from playing properly, and students may focus more on visual elements rather than on the instructional content. To address these issues, many teachers implement strategies such as providing Learning Activity Sheets that guide students' attention while engaging with the PowerPoint and video presentations simultaneously.

When selecting media for differentiated instruction, teachers consider several key factors. These include the characteristics and needs of their students, the features and functions of the media, and how well the media align with the intended learning outcomes (Lackmann et al., 2021; Linnes et al., 2022). The effectiveness of the media in supporting comprehension, interactivity, and overall usability also influences teacher preferences (Lin et al., 2023).

Other important considerations include:

- Alignment with learning objectives
- Student learning styles and abilities
- Ease of integration and use
- Technological infrastructure and accessibility
- Cost-efficiency and adaptability to different contexts
- Flexibility in presentation and content delivery (Santiago Jr. et al., 2021; Sulastri et al., 2024)

These insights into teacher preferences are valuable for informing future teacher training programs, especially those aimed at enhancing digital pedagogy in differentiated learning environments. By understanding how teachers choose and use digital media, training initiatives can better support personalized instruction based on individual student needs.

However, this study is limited by the scope of its sample. Future research should involve a broader and more diverse group of educators to further explore digital media selection in support of differentiated learning.

4. CONCLUSION

This study concludes that differentiated learning relies heavily on the teacher's ability to accommodate students' unique characteristics and learning needs, whether individually or in groups. Differentiated instruction can be implemented through three key approaches: content, process, and product. Its effectiveness is greatly enhanced when integrated with appropriate learning media that support learner diversity. Among primary school teachers in Malang City, PowerPoint and video emerged as the most commonly used tools for this purpose. Multiple factors, including alignment with learning objectives, suitability to student characteristics, ease of use, interactivity, effectiveness in content delivery, accessibility, adaptability, cost-efficiency, and the availability of necessary infrastructure, influence teachers' preferences in selecting these media. This research involved a qualitative study of 30 teacher facilitators in Malang City who had completed the Teacher Professional Education program. However, the study's scope is limited by the small sample size and focus on a specific geographic area. Future research is recommended to explore learner engagement and outcomes when using PowerPoint compared to video-based instruction and to include broader and more diverse samples. These findings can inform the development of teacher training programs and professional workshops, aimed at enhancing teaching quality through effective integration of digital learning media in differentiated instruction.

REFERENCES

Abedi, E. A. (2024). "We [teachers] first require basic technical [skills] training": Investigating formal professional development pathways and knowledge needs of teachers for technology integration. *Education and Information Technologies*, *29*(10), 11793–11814. https://doi.org/10.1007/s10639-023-12344-w

Alhamuddin, A., Inten, D. N., Mulyani, D., Suganda, A. D., Juhji, J., Prachagool, V., & Nuangchalerm, P. (2023). Multiple intelligence-based differential learning on critical thinking skills of higher education students. *International Journal of Advanced and Applied Sciences*, *10*(8), 132–139. https://doi.org/10.21833/ijaas.2023.08.015

Arochman, T., & Fortinasari, P. B. (2024). Implementation of technology-based learning by pre-service teachers during teaching practice program. *Premise: Journal of English Education*, *13*(1), 126. https://doi.org/10.24127/pj.v13i1.8988

Asipi, L. S., Rosalina, U., & Nopiyadi, D. (n.d.). The Analysis of Reading Habits Using Miles and Huberman Interactive Model to Empower Students' Literacy at IPB Cirebon. *International Journal of Education and Humanities (IJEH)*, *2*(3), 117–125. Retrieved from http://i-jeh.com/index.php/ijeh/index

Bardy, T., Holzäpfel, L., & Leuders, T. (2021). Adaptive Tasks as a Differentiation Strategy in the Mathematics Classroom: Features from Research and Teachers' Views. In *Mathematics Teacher Education and Development* (Vol. 23).

Chang, P., Zhou, L., & Zhang, L. J. (2024). The roles of task-specific self-efficacy and enjoyment in EFL learners' development of speaking CALF: A longitudinal study. *System*, *127*, 103539. https://doi.org/https://doi.org/10.1016/j.system.2024.103539

Deng, R., & Gao, Y. (2023). Effects of embedded questions in pre-class videos on learner perceptions, video engagement, and learning performance in flipped classrooms. *Active Learning in Higher Education*, *25*(3), 473–487. https://doi.org/10.1177/14697874231167098

Draijer, E. M. (2020). *Whiteboard Animation And Powerpoint Presentations In Learning*.

Elitzur, R., Katz, N., Muttath, P., & Soberman, D. (2024). The power of machine learning methods to predict crowdfunding success: Accounting for complex relationships efficiently. *Journal of Business Venturing Design*, *3*, 100022. https://doi.org/https://doi.org/10.1016/j.jbvd.2024.100022

El-Sabagh, H. A. (2021). Adaptive e-learning environment based on learning styles and its impact on development students' engagement. *International Journal of Educational Technology in Higher Education*, *18*(1). https://doi.org/10.1186/s41239-021-00289-4

Eti, S., Yüksel, S., Dinçer, H., Pamucar, D., Deveci, M., & Olaru, G. O. (2024). A machine learning and fuzzy logic model for optimizing digital transformation in renewable energy: Insights into industrial information integration. *Journal of Industrial Information Integration*, *42*, 100734. https://doi.org/https://doi.org/10.1016/j.jii.2024.100734

Gheyssens, E., Coubergs, C., Griful-Freixenet, J., Engels, N., & Struyven, K. (2022). Differentiated instruction: the diversity of teachers' philosophy and praxis to adapt teaching to students' interests, readiness and learning profiles. *International Journal of Inclusive Education*, *26*(14), 1383–1400. https://doi.org/10.1080/13603116.2020.1812739

Grecu, Y. V. (2023). Differentiated instruction: Curriculum and resources provide a roadmap to help English teachers meet students' needs. *Teaching and Teacher Education*, *125*, 104064. https://doi.org/https://doi.org/10.1016/j.tate.2023.104064

Heidari, A., Heidari Tabrizi, H., & Chalak, A. (2020). Using short stories vs. video clips to improve upper intermediate EFL students' sociopragmatic knowledge: Speech acts in focus. *Cogent Arts & Humanities*, *7*(1), 1778977. https://doi.org/10.1080/23311983.2020.1778977

Henderson, M. L., & Schroeder, N. L. (2021). A Systematic review of instructor presence in instructional videos: Effects on learning and affect. *Computers and Education Open*, *2*, 100059. https://doi.org/https://doi.org/10.1016/j.caeo.2021.100059

Hidayat, L. E., Basthomi, Y., & Afrilyasanti, R. (2024). Exploring secondary school teachers' creativity in differentiated instruction (DI) practices across Indonesian EFL classrooms. *Thinking Skills and Creativity*, *53*, 101620. https://doi.org/https://doi.org/10.1016/j.tsc.2024.101620

Huang, Q., & Xia, S. (2024). Preparing learners for digitally mediated academic communication: Digital multimodal practice in students' knowledge dissemination videos. *Journal of English for Academic Purposes*, *71*, 101429. https://doi.org/https://doi.org/10.1016/j.jeap.2024.101429

Jiang, T., Luo, G., Wang, Z., & Yu, W. (2024). Research into influencing factors in user experiences of university mobile libraries based on mobile learning mode. *Library Hi Tech*, *42*(2), 564–579. https://doi.org/10.1108/LHT-11-2021-0423

Johler, M., & Krumsvik, R. J. (2024). Increasing inclusion through differentiated instruction in a technology-rich primary school classroom in Norway. *Education 3-13*, *52*(8), 1207–1221. https://doi.org/10.1080/03004279.2022.2143721

Jurnal, H., Susanti Suparman, N., Irsandi, F., & Tinggi Agama Islam Nurul Falah Airmolek, S. (2022). Adapting language teaching methods to generation y's learning styles: a study in the context of modern education. *Jurnal Pendidikan Dan Pemikiran*, *17*(2).

Lackmann, S., Léger, P. M., Charland, P., Aubé, C., & Talbot, J. (2021). The influence of video format on engagement and performance in online learning. *Brain Sciences*, *11*(2), 1–21. https://doi.org/10.3390/brainsci11020128

Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, *55*(1), 79–105. https://doi.org/10.1080/09523987.2018.1439712

León, S. P., & García-Martínez, I. (2021). Impact of the provision of PowerPoint slides on learning. *Computers & Education*, *173*, 104283. https://doi.org/https://doi.org/10.1016/j.compedu.2021.104283

Lin, X., Tang, W., Ma, W., Liu, Y., & Ding, F. (2023). The impact of media diversity and cognitive style on learning experience in programming video lecture: A brainwave analysis. *Education and Information Technologies*, *28*(8), 10617–10637. https://doi.org/10.1007/s10639-023-11608-9

Linnes, C., Ronzoni, G., Agrusa, J., & Lema, J. (2022). Emergency Remote Education and Its Impact on Higher Education: A Temporary or Permanent Shift in Instruction? *Education Sciences*, *12*(10). https://doi.org/10.3390/educsci12100721

Mirriahi, N., Jovanović, J., Lim, L.-A., & Lodge, J. M. (2021). Two sides of the same coin: video annotations and in-video questions for active learning. *Educational Technology Research and Development*, *69*(5), 2571–2588. https://doi.org/10.1007/s11423-021-10041-4

Mohapatra, D. P., & Zayapragassarazan, Z. (2021). Effective learner engagement strategies in visual presentations. *Journal of Education Technology in Health Sciences*, *8*(1), 2–11. https://doi.org/10.18231/j.jeths.2021.002

Mufanti, R., Carter, D., & England, N. (2024). Outcomes-based education in Indonesian higher education: Reporting on the understanding, challenges, and support available to teachers. *Social Sciences & Humanities Open*, *9*, 100873. https://doi.org/https://doi.org/10.1016/j.ssaho.2024.100873

out. (n.d.).

Park, K., Mott, B., Lee, S., Gupta, A., Jantaraweragul, K., Glazewski, K., … Lester, J. (2022). Investigating a visual interface for elementary students to formulate AI planning tasks. *Journal of Computer Languages*, *73*, 101157. https://doi.org/https://doi.org/10.1016/j.cola.2022.101157

Qorib, M. (2024). Analysis Of Differentiated Instruction As A Learning Solution In Student Diversity In Inclusive And Moderate Education. In *IJRS: International Journal Reglement & Society Analysis Of Differentiated Instruction As A Learning Solution …* (Vol. 5).

Rawashdeh, A. (2021). *Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives*. *19*(2), 107–117. Retrieved from www.ejel.org

Ribosa, J., & Duran, D. (2023). Students' feelings of social presence when creating learning-by-teaching educational videos for a potential audience. *International Journal of Educational Research*, *117*, 102128. https://doi.org/https://doi.org/10.1016/j.ijer.2022.102128

Santiago Jr, C. S., Leah Ulanday, M. P., Jane Centeno, Z. R., Cristina Bayla, M. D., & Callanta, J. S. (2021). Flexible Learning Adaptabilities in the New Normal: E-Learning Resources, Digital Meeting Platforms, Online Learning Systems and Learning Engagement. *Asian Journal of Distance Education*, *16*(2), 38.

Smets, W., De Neve, D., & Struyven, K. (2022). Responding to students' learning needs: how secondary education teachers learn to implement differentiated instruction. *Educational Action Research*, *30*(2), 243–260. https://doi.org/10.1080/09650792.2020.1848604

Sulastri, D., Andriana, E., & Syachruroji, A. (2024). *58 Improving Elementary School Students' Science Literacy through Office Sway Interactive Learning Media*. *5*(2), 143. https://doi.org/10.35719/educare.v5i2.306

Sun, Y., Li, L., Meng, Z., Sun, H., Cao, R., Liu, R., … Liu, N. (2024). Rapid on-site differentiation of turbot from different culture modes using miniaturized near infrared spectroscopy coupled with interpretable machine learning. *Microchemical Journal*, *207*, 111981. https://doi.org/https://doi.org/10.1016/j.microc.2024.111981

Sun, Z., Yang, Q., Yan, N., Chen, S., Zhu, J., Zhao, J., & Sun, S. (2024). Utilizing deep learning algorithms for automated oil spill detection in medium resolution optical imagery. *Marine Pollution Bulletin*, *206*, 116777. https://doi.org/https://doi.org/10.1016/j.marpolbul.2024.116777

Tadele Kahsay, T., Gebreyohannes Berhe, G., & Mebrahtu Tesfamariam, G. (2024). The extent of audio-visual material use in the teaching and learning of chemistry in secondary schools. *African Journal of Chemical Education-AJCE*, *14*(2), 14.

Theobald, M. (2021). Self-regulated learning training programs enhance university students' academic performance, self-regulated learning strategies, and motivation: A meta-analysis. *Contemporary Educational Psychology*, *66*, 101976. https://doi.org/https://doi.org/10.1016/j.cedpsych.2021.101976

Tri, C., Anggraeny, F., Dewi, D. N., & Anggraeny, T. F. (2023). An analysis of teacher strategies in teaching english using differentiated learning. *English Journal of Indragiri*, *7*(1).

Wang, Q., & Kumar, K. (2024). An inverse analysis of fluid flow through granular media using differentiable lattice Boltzmann method. *Journal of Rock Mechanics and Geotechnical Engineering*, *16*(6), 2077–2090. https://doi.org/https://doi.org/10.1016/j.jrmge.2024.03.010

Wu, J.-Y., Liao, C.-H., Tsai, C.-C., & Kwok, O.-M. (2024). Using learning analytics with temporal modeling to uncover the interplay of before-class video viewing engagement, motivation, and performance in an active learning context. *Computers & Education*, *212*, 104975. https://doi.org/https://doi.org/10.1016/j.compedu.2023.104975

Xu, C., Jia, W., Wang, R., He, X., Zhao, B., & Zhang, Y. (2023). Semantic Navigation of PowerPoint-Based Lecture Video for AutoNote Generation. *IEEE Transactions on Learning Technologies*, *16*(1), 1–17. https://doi.org/10.1109/TLT.2022.3216535

Yang, F., & Miang Goh, Y. (2022). VR and MR technology for safety management education: An authentic learning approach. *Safety Science*, *148*, 105645. https://doi.org/https://doi.org/10.1016/j.ssci.2021.105645

Zhao, L., Liu, X., & Su, Y. S. (2021). The differentiate effect of self-efficacy, motivation, and satisfaction on pre-service teacher students' learning achievement in a flipped classroom: A case of a modern educational technology course. *Sustainability (Switzerland)*, *13*(5), 1–15. https://doi.org/10.3390/su13052888

Ziegler, J., Dobsch, P., Rozema, M., Zuber-Jerger, I., Weigand, K., Reuther, S., … Kandulski, A. (2024). Multimodal convolutional neural network–based algorithm for real-time detection and differentiation of malignant and inflammatory biliary strictures in cholangioscopy: a proof-of-concept study (with video). *Gastrointestinal Endoscopy*. https://doi.org/https://doi.org/10.1016/j.gie.2024.09.001