ISSN 2303-0992
ISSN online 2621-3176
Matematika dan Pembelajaran
Volume 13, No. 2, December 2025, p. 355-378
Submitted: August 05, 2025; **Revised**: December 23, 2025; **Accepted**: December 25, 2025

ANALYSIS MATHEMATICS TEACHER EXPERIENCE IN DEVELOPMENT OF LEARNING MEDIA BASED ON CANVA AND OPEN BROADCASTER SOFTWARE (OBS) IN THE MERDEKA CURRICULUM

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Abstrak

Penelitian ini dilatarbelakangi oleh perlunya inovasi media pembelajaran yang mendukung implementasi Kurikulum Merdeka, namun masih terdapat kesenjangan antara kebijakan digitalisasi pendidikan dan kemampuan guru dalam mengadopsi serta memanfaatkan teknologi pembelajaran secara efektif. Kesenjangan itu nampak dengan masih terdapat banyak guru yang belum menguasai atau mengenal beberapa aplikasi digital dalam pembelajaran. Sedangkan kondisi saat ini menuntut para guru untuk menggunakannya sebagai akibat dari adanya kebijakan baik dari instansi pemerintah maupun swasta. Penelitian ini bertujuan untuk menganalisis respon dan pengalaman guru matematika dalam mengembangkan media pembelajaran berbasis Canva dan Open Broadcaster Software (OBS) pada Kurikulum Merdeka. Metode penelitian menggunakan pendekatan kualitatif fenomenologis dengan teknik pengumpulan data melalui wawancara dan angket daring kepada sepuluh guru matematika MI Nurul Huda kota Malang yang telah menggunakan Canva dan OBS. Data dianalisis secara deskriptif kualitatif merujuk pada Miles dan Huberman yang meliputi tahap reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa Canva banyak dimanfaatkan untuk membuat materi visual yang menarik, sedangkan OBS digunakan untuk merekam atau menyiarkan video pembelajaran. Kendala utama yang dihadapi guru adalah keterbatasan waktu, akses fitur premium, serta kurangnya pelatihan teknis. Temuan ini menunjukkan perlunya pelatihan intensif, dukungan teknis, serta penyediaan akses terhadap sumber daya digital guna mendukung integrasi media pembelajaran berbasis teknologi dalam Kurikulum Merdeka
Kata kunci: Kurikulum Merdeka; Canva; OBS; Media Pembelajaran; Guru Matematika.

Abstract

This research is motivated by the need for innovative learning media to support the implementation of the Merdeka Curriculum, yet there is still a gap between the policy of education digitalization and teachers' ability to effectively adopt and utilize learning technology. This gap is evident in the fact that many teachers still do not master or are unfamiliar with several digital applications for learning. Meanwhile, the current conditions require teachers to use it as a result of policies from both government and private institutions. This research

aims to analyze the responses and experiences of mathematics teachers in developing Canva and Open Broadcaster Software (OBS)-based learning media within the Merdeka Curriculum. The research method uses a phenomenological qualitative approach with data collection techniques thru interviews and online questionnaires administered to ten mathematics teachers at MI Nurul Huda in Malang who have used Canva and OBS. The data were analyzed descriptively and qualitatively, referring to Miles and Huberman, which included data reduction, data presentation, and conclusion drawing stages. The research results show that Canva is widely used to create engaging visual materials, while OBS is used to record or broadcast educational videos. The main obstacles faced by teachers are time constraints, limited access to premium features, and a lack of technical training. These findings highlight the need for intensive training, technical support, and access to digital resources to support the integration of technology-based learning media into the Merdeka Curriculum.
Keywords: Merdeka Curriculum, Canva, OBS, Learning Media, Mathematics Teachers.

Citation: Irawan, W. H., Firdausi, Q., Ratnasari, N., Sa'adah, U. L. 2025. Analysis Mathematics Teacher Experience in Development of Learning Media Based on Canva and Open Broadcaster Software (OBS) in The Merdeka Curriculum. *Matematika dan Pembelajaran*, 13(2), 355-378. DOI: http://dx.doi.org/10.33477/mp.v13i2.11402

INTRODUCTION

The current development of digital technology has brought about significant transformations in the world of education, including in the development of learning media. This condition requires teachers to be able to adapt to changes in the learning paradigm, which is more creative and interactive (Melisa, 2024). Digital learning media plays a key role in increasing student engagement and supporting more varied learning methods, such as flipped classrooms, blended learning, and project-based learning (Siburian et al., 2022). This means that digital learning media is very suitable and supportive for the implementation of the Merdeka Curriculum. As stated by Pasri (2025), the Merdeka Curriculum is the latest national curriculum that emphasizes differentiated learning, strengthening the profile of Pancasila students thru projects, and flexibility in developing material according to student characteristics and educational units. This aligns with Wibawa & Legawa (2022) statement that the Merdeka Curriculum emphasizes the importance of differentiated, project-based learning, and strengthening teacher creativity in

developing contextual and interactive teaching materials. Based on the author's latest observations, particularly of several elementary school mathematics teachers, there is evidence of teachers' difficulty in integrating digital technology into classroom teaching practices. Thus, adjustments are needed in the field, as stated by Pratiwi & Hasma (2024), namely that there are challenges in optimizing digital technology learning media in mathematics education

Kedungkandang sub-district in Malang city only has one state junior high school and does not yet have a state elementary school. Preliminary observations and informal interviews conducted in May 2024 with approximately 50% of teachers at State Junior High Schools have shown that over 85% of teachers are familiar with digital applications such as Ruang Guru, Quipper, Moodle, learning videos, e-modules, e-LKPD, and e-books; and approximately 50% of these teachers have used them. However, at one Private Elementary School in Kedungkandang District, it was found that over 50% of teachers are not yet accustomed to using digital media in their teaching. This is because most teachers have never received training on using graphic design applications or digital broadcasting devices for teaching activities. Data documentation from the KKG (Teacher Working Group) activities in Kedungkandang District shows that digital technology training has not been included as a main agenda for the past 3 years. Generally, teachers still rely on conventional methods like blackboards and textbooks; while the use of digital media is only done by a few young teachers who have access to personal devices and basic technological knowledge. This condition indicates that teachers' awareness and ability to utilize technology-based learning media still need to be improved to make the teaching and learning process more interactive and contextual. This phenomenon indicates that the use of digital technology in the field of education in the Kedungkandang area is still relatively slow.

Every form of digital learning media that can be used in learning certainly has a specific meaning and function. As stated by Triyanto et al. (2024) that every form of learning media is used to convey learning messages so that it can stimulate

students' attention, interest, and understanding. It was further stated that learning media applications for design or digital broadcasting, such as Canva and OBS (Open Broadcaster Software), both have great potential in supporting visual and interactive learning, but their adoption rate among teachers is considered low. In line with this, Hapsari & Zulherman (2021) stated that Canva is an online graphic design application that provides a variety of visual templates such as infographics, posters, and interactive presentations that can support the learning process. From both, the author states that Canva not only serves as a design tool, but also as a means to encourage teacher creativity and simplify the preparation of contextual learning media. As stated by Sholeh et al. (2020), Canva provides a variety of photos that can be used to represent a happy atmosphere, ready-to-use content formats, and diverse typography and line options to help develop ideas in designing lesson plans. Thus, the Canva application has many advantages in supporting the planning of learning media. This platform offers a variety of interesting layout, movement, and page numbering options that can stimulate teacher creativity, as stated by Rahmah (2025). One of the advantages of using Canva is that it saves planning time, produces visually appealing, high-quality media that can be printed in programd sizes, and allows students to understand the material more easily. Additional advantages include collaboration features and the flexibility to use it on both PCs and mobile phones. Lestari et al. (2022) added that media created thru Canva can be downloaded in PDF and JPG formats and integrated with PowerPoint for more dynamic presentations.

Furthermore, Dwipangga & Andri (2024) stated that OBS is a widely used screen recording and live streaming software for creating interactive video content. In line with this opinion, it means that using OBS in learning provides opportunities for teachers to create an interactive and participatory learning environment. On the other hand, OBS is an easily accessible and free tool, meaning that teachers can easily design engaging and innovative lessons without incurring any costs. Its use in face-to-face learning will allow students to follow the lesson directly or in real-

time, as stated by Nugroho (2022). Next, regarding the advantages, OBS offers good performance in capturing and mixing video and audio in real-time, an unlimited number of scenes with seamless transitions using special effects, and an audio mixer equipped with filters such as noise gate, noise suppression, and gain. This aligns with Amanullah & Wiharja (2022) statement that the OBS application offers powerful yet easy-to-use configuration options, an efficient settings panel for accessing various options to change broadcast or recording aspects, and the ability to rearrange the layout. Thus, the characteristics of OBS show that this platform allows teachers to present immersive and flexible learning experiences, can be used for concept visualization, making it very suitable in the context of mathematics learning which requires representations other than verbal and symbolic.

Then, there is previous research that has highlighted the use of digital media such as Canva and OBS in learning, although both are still being studied separately. Such as the research by Maolida & Salsabila (2021), which aimed to determine the effect of using Canva on student engagement and learning interest. The research used a descriptive qualitative approach thru observation and interviews, with the results showing that Canva can enhance students' visual engagement and strengthen their learning motivation thru its attractive and easy-to-operate interface. In line with the research findings, Jannah et al. (2023) analyzed the potential of the digital media Canva and OBS in mathematics learning thru a literature study and limited experiments. The results of his research show that Canva is effective for visual presentation, while OBS is useful for broadcasting online learning, but there has been no study that integrates both simultaneously. The research findings are supported by Sunardi et al. (2021), who have researched the effectiveness of OBS in creating learning videos using a classroom action research approach. The results indicate that OBS helps teachers create interactive videos and increase student participation, although it requires high technical skills and considerable time to operate.

However, there is still limited research that integrates the simultaneous use of Canva and OBS in the context of mathematics learning based on the Merdeka Curriculum. Most studies only focus on the separate use of one of the platforms and have not examined how the two are synergistically integrated in the mathematics learning process, particularly within the context of the Merdeka Curriculum. Considering that the Merdeka Curriculum emphasizes the importance of teacher independence and creativity in developing contextual and engaging teaching materials. From this, this research attempts to examine the experiences of mathematics teachers in simultaneously integrating the use of Canva and OBS to support digital learning, particularly at the Madrasah Ibtidaiyah level

Thus, this research is highly relevant because both platforms have synergistic potential in supporting the implementation of the Merdeka Curriculum. There are still obstacles in the field, particularly at the Madrasah Ibtidaiyah (Islamic Elementary School) that was used as the research location. The obstacle is that the use of digital learning media, which should be a means of strengthening teachers' creativity and independence, has not been effectively integrated by most mathematics teachers due to limitations in technical skills, infrastructure, and time to learn new applications. As a result, technology-based learning has not been fully implemented in the implementation of the Merdeka Curriculum. Thus, training on using Canva and OBS was first provided to all teachers, including mathematics teachers in all classes

In this context, the novelty of this research lies in the empirical exploration of teachers' experiences in the field in simultaneously combining the use of Canva and OBS, particularly in Madrasah Ibtidaiyah which face resource limitations. The urgency of this research is based on the need to improve teachers' competence in designing digital learning media that are relevant, applicable, and aligned with curriculum demands. By examining teachers' experiences, the challenges they face, and the problem-solving strategies they employ, this research can contribute to

improving the quality of teaching and the professional development of teachers, particularly in mathematics.

Based on the description, this research focuses on the experiences, responses, and challenges faced by teachers (including mathematics teachers) in utilizing digital learning media based on Canva and OBS. Each participant has a role in designing, implementing, and evaluating learning (including mathematics) using Canva and OBS-based digital technology in accordance with the principles of the Merdeka Curriculum. Therefore, this research began with an empirical exploration of elementary madrasah teachers' experiences in simultaneously integrating these two digital platforms despite limitations in facilities and technological support. The focus of this research is directed toward answering questions about how mathematics teachers experience developing Canva and OBS-based learning media within the Merdeka Curriculum, how teachers respond to their use in supporting learning, and what obstacles are faced along with the strategies implemented to overcome them.

The selection of Kedungkandang District as the research location is based on the reason of deeply understanding the phenomenon of teacher experiences in the environment of elementary madrasahs facing limitations in digital infrastructure and facilities. This aligns with the phenomenological qualitative approach, which emphasizes understanding the meaning of the subject's experiences rather than generalizing research findings. This research contributes theoretically by enriching the study of digital media integration in mathematics learning based on the Merdeka Curriculum, and practically by providing strategic recommendations for improving the digital competence of madrasah teachers thru contextual training and mentoring.

METHOD

This research is classified as service research because it began with training on the use of the Canva and OBS applications for all teachers at Nurul Huda Elementary Madrasah. Subsequently, the teachers immediately practiced using

these applications to create the desired output and could use them directly in classroom learning. Although there are some teachers who are familiar with it and have already used it in their classroom teaching, which is no more than 5 teachers out of a total of 45. This research uses a qualitative approach with a phenomenological type, aiming to uncover the meaning of mathematics teachers' experiences in developing digital learning media based on Canva and OBS. The qualitative approach was chosen because the data is not in the form of scores, but rather narratives that contextually reveal teachers' experiences in utilizing digital media as part of the implementation of the Merdeka Curriculum, as stated by Sapto (2020). Meanwhile, the phenomenological type was chosen because this research delves into the phenomena that occur deeply from the experiences and perceptions of elementary madrasah teachers in utilizing the Canva and OBS applications in learning. It's not about generalizing the results, but the meaning of the phenomena that occur, as stated by Safarudin et al. (2023).

The research subjects were ten people, including all the mathematics teachers from the Nurul Huda elementary school in Kedungkandang District, Malang City. The selection of subjects was done using purposive sampling, considering several criteria: a) teachers had at least two years of teaching experience (including mathematics); b) were familiar with Canva and OBS, meaning they had knowledge and experience in using or had tried using them in teaching activities; c) were willing to participate in in-depth interviews; and d) showed variation in the level of digital media utilization. The selection of the ten teachers was based on the uniqueness and diversity of their experiences, such as differences in technical skill levels and the intensity of Canva and OBS usage, in accordance with the principles of the phenomenological approach, which emphasizes understanding the meaning of the subject's experiences rather than the number of participants, as stated by Hansen (2020).

Data collection began with the distribution of questionnaires to all 45 teachers at Madrasah Ibtidaiyah Nurul Huda after they completed training on using the

Canva and OBS applications. The purpose of the questionnaire was to obtain a complete initial overview of the level of Canva and OBS usage, the perceived goals and benefits, technical and pedagogical obstacles, and teachers' strategies for overcoming these obstacles; all of which served as the observed indicators. Next, the questionnaire was developed using a five-point Likert scale (strongly disagree to strongly agree) containing 15 closed-ended questions. The questionnaire questions adapt the general concept of utilizing digital learning media from various literature and technology-based learning theories to suit the context of mathematics teachers in elementary schools. From all the teachers, 10 people were selected for interviews, based on previously established criteria. Then, the second data collection was done thru interviews with all subjects. The interview guide was developed based on the results of the questionnaire, covering topics related to teachers' experiences, responses, and strategies in using Canva and OBS. Data from the questionnaire were processed descriptively by calculating the percentage of respondents' answers for each statement. The results of this analysis are used to show the trend in the level of digital media usage among teachers and serve as the basis for formulating follow-up questions in in-depth interviews, as stated by Qomaruddin & Sa'diyah (2024).

The data analysis conducted refers to Miles and Huberman (1992), which includes three main stages: data reduction, data presentation, and conclusion drawing. Data reduction was performed by selecting, grouping, and simplifying the data from interviews and questionnaires based on the main themes, namely teachers' experiences, responses, and obstacles in using Canva and OBS. Data presentation was then done in the form of descriptive narratives in thematic tables to illustrate patterns in teachers' experiences. Meanwhile, conclusions were drawn inductively by interpreting the meaning of teachers' experiences and finding relationships between the use of Canva, OBS, and the implementation of the Merdeka Curriculum in mathematics learning

Data analysis is divided into criteria: the level of digital media utilization, perceptions of the effectiveness of Canva and OBS, technical and pedagogical barriers experienced by teachers, and the strategies used to overcome them. Data validity was ensured thru method triangulation and member checking, as stated by Mckim (2023). Method triangulation was conducted by comparing data from interviews, questionnaires, and supporting documents such as lesson plans or learning media created by teachers. Meanwhile, member checking was done by directly asking subjects and participants for confirmation regarding the researcher's interpretation results to ensure the meaning conveyed aligns with their original experiences.

RESULT AND DISCUSSION

The results of the questionnaire on the use of Canva and OBS by mathematics teachers at Nurul Huda Elementary Madrasah are presented in five aspects, including the level of use, purpose, benefits, obstacles, and solutions implemented. Regarding the usage level aspect, approximately 80% of teachers immediately practiced the Canva application used to create visually and textually appealing infographic presentations; and about 30% of teachers practiced the OBS application by recording their screens or broadcasting. Meanwhile, based on the output produced by the teachers after the training, the Canva application was widely used to create PPTs, worksheets, student activity sheets, posters, and videos; while the OBS application was used to create instructional videos for delivering material. The benefits they felt were that learning was more engaging and they were very enthusiastic about creating learning media using Canva, as well as learning videos that could be rewatched and used for distance learning. The obstacles that arose were unstable internet connection and lack of familiarity. There are also still laptops that are not fully compatible with installing the paid Canva and OBS applications. The final part about the solutions implemented is finding free applications and self-study tutorials online as a form of repetition and mastery using the applications.

The overall data summary from the questionnaire is presented to summarize the patterns of Canva and OBS usage by teachers based on five main aspects, as shown in Table 1 below.

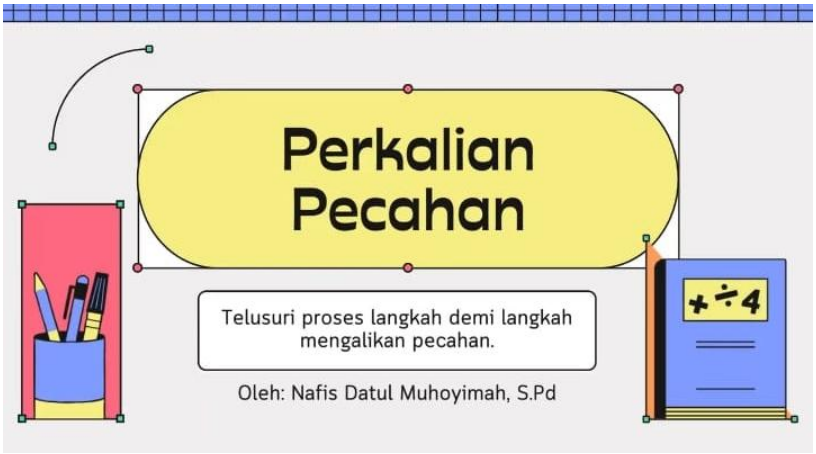
Table 1. Summary of Canva and OBS Use by Mathematics Teachers

Aspect	Canva	OBS
Usage Level	There are approximately 80% of teachers are already using it to create engaging visual and text-based presentation infographics.	There are approximately 30% of teachers who have already tried creating screen recordings or broadcasts.
Purpose of Use	Create learning media works in the form of PPT, worksheets, student activity sheets, posters, and videos	Creating learning videos to deliver material and recording learning videos, live streaming online learning.
Benefits Felt	Easy to work with, learning becomes more interesting, and there's a high enthusiasm for creating visual and text-based learning media. It can be played repeatedly and is easy to operate.	Learning becomes more interesting, but it's a bit complicated, making me less enthusiastic about creating educational videos. Learning can be rewatched and is more flexible. Distance learning is online and can be recorded
Obstacle	Requires a stable internet connection, many premium features and paid applications. Not yet accustomed to using digital features because I am new to them and haven't mastered them perfectly.	Not yet accustomed to and familiar with using digital features because they are new and not yet mastered; there are still laptops that do not support installing applications. There are still many paid features and applications.
Solutions Taken	Using free templates, searching for online tutorials	Self-study tutorials, basic training from the community or colleagues, and thru the internet.

Based on Table 1, based on the usage level aspect, it shows that Canva has a higher adoption rate compared to OBS among Nurul Huda Elementary School teachers. Quantitatively, the digital learning media works designed and created by teachers also use Canva more than OBS. This can be seen based on the purpose of use. Another reason teachers are more familiar with using the Canva application is

that its interface is simpler and easier to work with than OBS, although both can be played repeatedly. By implementing the use of both in classroom learning practice, learning becomes more engaging and teachers are motivated to create. This is supported by the benefit aspect. Then both have almost the same obstacles, namely the lack of stable internet connection support and many paid features and applications. Another obstacle is that some teachers' laptops are not fully compatible with installing applications. Next, to familiarize them with mastering the development of using both applications, the teachers conducted online searches for self-study tutorials, sought help from colleagues, and utilized available free templates

From the five aspects presented in Volume 1, it is evident that both Canva and OBS applications have great potential in supporting the Merdeka Curriculum learning. Things to consider are ease of access, availability of training, digital literacy levels, and application availability. The use of the Canva application is more dominant among teachers, which is supported by aspects of usage level, benefits, goals, and solutions. Canva was adopted more quickly because it has a simple interface and doesn't require high technical skills, as stated by Rahma et al. (2024). On the other hand, using the OBS application requires additional time investment and training for optimal utilization, considering the application demands more complex technical understanding. This is supported by the results of interviews with research subjects, who stated that using the OBS application is still considered complex and requires further technical assistance. Nevertheless, teachers who have tried using the OBS application have acknowledged its effectiveness for online learning and recording materials. Figure 1 shows an example of a visual PowerPoint presentation created by a teacher using the Canva application, demonstrating how mathematical material can be visually packaged to make it more engaging and easier for students to understand.



in the picture:

Multiplying Fractions

explore the step-by-step process of multiplying fractions

by Nafis Datul Muhoyimah, S.Pd.

Figure 1. Example of Teacher Made Mathematics Learning Media with Canva

This visualization reinforces the finding that teachers can adopt Canva to create communicative and esthetically pleasing learning materials, despite still facing technical limitations such as internet connectivity and device access. The image serves as an illustration of one of the teacher's works and is not intended to represent the entire research subject. This example shows that the training teachers attended had a positive impact on their ability to design digital teaching media that is engaging and appropriate for student characteristics. Thus, these visual results illustrate individual abilities in a real-world context, while general trends regarding the use of Canva and OBS have been explained thru previous questionnaire and interview data.

Teachers' interest in Canva is not only due to its attractive appearance, but also because of its ease of use, which supports the visual delivery of material, as stated by Kharissidqi & Firmansyah (2022). This is supported by the statement of one of the STR subjects, *"I have used Canva several times to create learning posters. But I haven't dared to use OBS yet because it looks complicated."* This

statement indicates a digital divide in the mastery of more complex technologies. Although Canva is relatively well-known, the use of its features is not yet fully optimized. Furthermore, the STR subject stated, *"I have used Canva once for classroom learning, but I still experience obstacles such as unstable internet connection. Beside that, I am also still learning to understand its features."* This indicates that technical barriers such as connection and time constraints are hindering deeper exploration of Canva's potential. Next, the use of the OBS application in learning is still in the introductory phase. Some teachers acknowledge the great potential of the OBS application, but they find it difficult to get started. As stated by the following STR subject, *"I'm not used to using OBS yet, but this application seems good for recording and live streaming."* This implies the importance of ongoing technical training, not just an initial introduction.

This is also supported by the statements of the IKS subjects, namely, *"OBS is good, but it takes time to get used to because there are many features that need to be learned."* From the statements of both subjects, it reflects the challenges in the process of adopting complex technology, especially in the context of elementary schools that have limited infrastructure and time. Nevertheless, the training provided has had a positive impact on teachers' perceptions and skills. As stated by the STR subject, *"Canva is very helpful, especially after the training. With Canva, I can create more engaging and interactive learning videos."* This shows that the training not only improves technical knowledge but also fosters teachers' confidence in creating digital learning media. Next, the limitations of the free features on Canva are also a concern. This is also in line with Subject NF, who stated, *"The drawback is that some templates and items in Canva are not free, so I have to search for images on Google first, which makes the process longer."*

Ultimately, these findings illustrate that teachers' readiness to integrate technology into learning depends not only on initial knowledge of applications, but also on technical support, time, and access to resources. Canva tends to be adopted more quickly because it is simpler and more visual, while OBS requires a more

intensive investment of time and training to be used to its full potential, as stated by Dwi et al, (2021).

Next, the researcher presents the differences between the questionnaire and interview results in Table 2. The percentages used are descriptive to illustrate the teachers' response trends regarding the use of Canva and OBS in learning.

Table 2. Comparison of Questionnaire and Interview

Aspect	Questionnaire Results	Interview Findings	Temporary Conclusion
Canva usage levels	There are approximately 80% of teachers regularly use Canva to create PPT presentations, worksheets, student activity sheets, and posters.	All subjects rated Canva as easy to use and not requiring special training. This application was chosen because its features are simple and can be used directly to create visual learning media.	Canva is popular because of its simple interface and support for visual learning needs..
OBS usage levels	Only 30% of teachers have ever tried OBS for recording or broadcasting lessons, and these were in the form of learning videos to deliver the material.	All subjects considered OBS to have great potential but found it too complex to use without technical training. Time constraints and technological capabilities are the main reasons for low usage.	OBS is rarely used due to its technical complexity and minimal teacher training.
Purpose of use	Canva: used for creating visual media; OBS: used for recording and streaming learning.	The teacher uses Canva to make the presentation of the material more interesting and help visualize mathematical concepts, while OBS is used to record online learning so that students can access it again.	Canva and OBS have complementary functions, but they are not yet integrated simultaneously..
Benefits felt	There are 80% of teachers feel that Canva makes learning	The experience and observations made by the subject thru the use of this application in classroom	Canva increases student motivation and makes it easier to deliver material,

Aspect	Questionnaire Results	Interview Findings	Temporary Conclusion
	more engaging and interactive.	learning acknowledge that using Canva makes learning more engaging, with greater student enthusiasm and spirit, and also makes it easier for students to understand abstract mathematical concepts. OBS is also considered beneficial because it allows for flexibility in online learning.	while OBS supports learning flexibility.
Obstacles and solutions	Nearly 60% of teachers cited internet issues and premium features as obstacles; 50% of teachers overcame these by using free templates and online tutorials.	The main obstacles are related to limited internet connectivity and a lack of technical skills. The subject coped by self-study, attending basic training, and sharing experiences with colleagues.	Technical barriers and facility limitations can be overcome thru teacher collaboration and self-directed learning.

The use of learning media is very helpful for teachers in conducting classroom instruction. As stated by Gagne and Briggs (1992), learning media serves as a tool to facilitate the delivery of information and strengthen conceptual understanding. Based on the differences in Table 2, it shows that Canva is far more dominant than OBS. This finding reinforces the indication that ease of access and a simple interface are key factors in teachers' selection of digital media. Canva allows for the visual and concrete presentation of mathematical concepts, which aligns with the principles of instructional design, as stated by Kristiana and Siregar (2025). In relation to the independent curriculum, the use of interactive and flexible media to accommodate students' individual learning needs is relevant, as stated by Rani et

al. (2023). Therefore, it can be concluded that the use of Canva and OBS supports this principle, provided the teacher has adequate technical skills.

The findings in this study support the results of Maolida & Salsabila (2021), which showed that Canva is able to increase student participation due to its attractive appearance and intuitive interface. This research aligns with Sunardi et al. (2021), who emphasized that using OBS requires technical training for teachers to use it optimally. This equation shows that the adoption of visual and multimedia technology does indeed provide more interactive learning opportunities, but it still depends on the teacher's capacity to manage that technology.

Additionally, research by Gustiawan (2025) indicates that intensive training can boost teachers' confidence in using digital media, especially in 3T areas (Tertinggal, Terdepan, and Terluar - Underdeveloped, Frontier, and Outermost). This confirms that the implementation challenge is not solely due to limitations in tools, but rather to the process of continuous competency development. This aligns with the findings of Isnaini et al. (2023), which highlight that the integration of digital media such as learning videos requires sufficient technical support and time so as not to become an additional burden for teachers.

Meanwhile, research by Safran et al. (2023) revealed that one of the main constraints for teachers in using Canva is limited access to premium features, which impacts creativity and efficiency in creating teaching materials. This is highly relevant to the findings in this study, where teachers had to find alternative images from other sources due to the limitations of their free Canva accounts. This shows that the economic aspects of technology (techno-economics) need to be considered in digital education policies.

Meanwhile, the research results of Pamungkas & Koeswanti (2022) state that the use of video-based media (including OBS) can increase student engagement if accompanied by good instructional design. In this context, this research makes a unique contribution because it not only highlights the potential of each application,

but also the complexity when both are used simultaneously within a single learning ecosystem. However, an important difference lies in the context.

This research was conducted in madrasas with limited access to technology and human resources, unlike most previous studies that focused on public schools or schools in urban areas with more complete facilities. Additionally, this research highlights the simultaneous use of Canva and OBS, an approach rarely explored in previous literature. This enriches the research findings with a more contextual field perspective and emphasizes the importance of an adaptive approach in teacher professional development in the era of the Merdeka Curriculum

These findings indicate that although teachers are willing to innovate, technical limitations and a lack of institutional support are significant obstacles. Canva is relatively easy to access and use, but not all features are available for free. OBS offers great potential for video-based learning, but it is not yet well-known among madrasah teachers. The implication is that needs-based training, particularly the use of Canva and OBS in the context of the Merdeka Curriculum, is very important to be conducted sustainably. Additionally, educational institutions can consider acquiring Canva for Education accounts and providing tiered practical OBS training to better prepare teachers to adapt to modern learning models

From a policy perspective, the data indicates that institutional support from both the education department and madrasah management significantly influences the successful integration of technology. Some teachers expressed that when the school provided dedicated time for producing learning materials and facilitated internal mentors, the utilization rate of OBS increased despite it initially being considered complex. This condition indicates that the process of technology adoption requires a supportive ecosystem, not just the availability of applications.

Teachers believe the most effective training is that which is structured in stages: starting with needs assessment, practical basic training, in-depth learning thru real projects, peer mentoring, and finally, results evaluation. This tiered training model is considered capable of addressing the digital literacy gap while

minimizing technical barriers in madrasas. Thus, structured training strategies are not only relevant as recommendations, but also emerge as patterns identified directly from teachers' practices in the field

Based on the analysis of questionnaire and interview data, teachers consider the most effective training to be that which is structured in a phased and continuous manner. This pattern consistently emerged from teachers' experiences in the field, allowing for the formulation of a training strategy relevant to the madrasah context, as shown in Table 3 below.

Table 3. Teacher Training Strategy Framework Based on Research Findings

Strategy Stage	Description	The main purpose
Needs Mapping	Internal survey to identify the level of proficiency in Canva and OBS, as well as technical/infrastructure barriers..	Determine the starting point and priorities of training.
Focused Basic Training	Creating infographics, worksheets, and short videos with Canva, an introduction to simple screen recording with OBS.	Provides practical skills that can be used immediately in the classroom.
Deepening Through Real Projects	The teacher created a learning product that combines Canva and OBS according to the Merdeka Curriculum topic.	Sharpening teachers' integrative and creative skills.
Peer Mentoring and Collaboration	Experienced teachers become mentors for other colleagues, a forum for sharing good practices.	Strengthening continuous learning and mutual support between teachers.
Evaluation of Results and Recognition of Competence	Assessment of the quality of the teaching media produced, granting of internal certificates.	Provide feedback and formal recognition of teacher achievements.

The implementation of the strategic framework has an impact on improving teacher competence. Interview data shows that tiered training makes it easier for teachers to understand the material step by step, reduces awkwardness toward new

technology, and encourages teachers to immediately practice the training results in the classroom. Additionally, the presence of peer mentoring has been proven to increase motivation because teachers feel supported and not working alone.

Participation in the evaluation and recognition of competency levels can bring a sense of achievement that motivates teachers to continue innovating. This aligns with the principles of adult learning (andragogy), which emphasize the importance of connecting material to real-world needs, providing opportunities for hands-on practice, and offering immediate feedback. Therefore, the training strategy developed based on the findings of this research not only focuses on improving technical skills but also plays a role in fostering teachers' self-confidence and commitment to integrating Canva and OBS into the learning process, in line with the direction of the Merdeka Curriculum.

CONCLUSION

In conclusion, the results of this study indicate that the use of digital learning media Canva and Open Broadcaster Software (OBS) in the implementation of the Merdeka Curriculum has great potential to enhance the interactivity and quality of mathematics learning in elementary madrasas. Math teachers tend to use the Canva application in their classroom instruction because of its simple interface, ease of use, and ability to help present material visually and attractively. Meanwhile, teachers' experience with OBS is still limited because the application is considered more complex and requires technical support and time to learn it in depth. Their experience in implementing both applications in classroom learning provided recognition that students had good enthusiasm and were more excited, the visualization of mathematical concepts was easier for students to understand, and there was two-way interaction between teachers and students and between students.

Despite the remaining obstacles of limited internet connectivity, access to premium features, and a lack of technical training, teachers are still taking the initiative to overcome these challenges thru self-directed learning, sharing experiences with colleagues, and utilizing online tutorials. This prompted the policy

to emphasize the importance of hands-on practice-based training focusing on the use of digital learning media or the simultaneous integration of Canva and OBS in mathematics learning. This will encourage teachers to always be creative thru the design of digital learning media. Therefore, this requires policy and technological support from educational institutions.

Although this research was conducted on a limited scale, its findings can serve as a reference for further studies involving more participants and a wider range of educational institutions. The results of this study make a real contribution to expanding research on teachers' experiences in utilizing digital learning media such as Canva and OBS; and can serve as a basis for developing teacher training strategies that are adaptable to two-way learning needs. Teachers need to know, recognize, try, master, and design digital learning media, and then apply them in the classroom. Further research is suggested to qualitatively answer the research questions regarding students' understanding of mathematical concepts thru digital visualization (which could be videos, e-LKPD, or other formats, and could also be digital visualizations integrating Canva and OBS). Alternatively, quantitative research could be conducted to determine the effectiveness of using Canva and OBS integration on improving students' learning outcomes. It can also be done thru a mixed methods approach and by developing a teacher needs-based training model that combines pedagogical and technical aspects. In relation to the independent curriculum, communication built thru two-way interaction can also be studied, both qualitatively and quantitatively. Thus, future research is expected to generate concrete strategies for strengthening teachers' digital competencies and supporting the successful implementation of the Merdeka Curriculum in various educational contexts.

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