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IMPLEMENTATION OF PERSONALIZED APPROACH IN VIDEO EDITING LEARNING TO IMPROVE DIGITAL COMPETENCY OF 21ST CENTURY LEARNERS

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ABSTRACT

This study aims to develop a learning design and evaluate the effectiveness of implementing a personalized learning approach in video editing education to enhance students' 21st-century digital competencies. The research focused on providing flexibility in the choice of video editing software to accommodate diverse hardware capabilities, ensuring inclusive participation regardless of students' device limitations. A sample of 20 students from the Content Creator extracurricular program at Al Ulum Medan Junior High School was selected based on specific criteria, particularly the inability to install Adobe Premiere Pro due to hardware constraints. Data collection methods included pre-test and post-test assessments, surveys, and skills tests. The data were analyzed using descriptive statistics and paired t-tests to assess improvement in video editing skills after allowing students to use software suited to their devices. The findings indicated a significant improvement, with a 40% increase in mean scores from pre-test to post-test. The personalized approach not only enhanced students' technical skills but also improved motivation and engagement. The study concludes that personalized learning, through adaptive software selection, is effective in overcoming technical barriers and significantly enhances video editing competencies among junior high school students.

Keywords: 21st Century Learning; Digital Competencies; Educational Technology; Personalized Learning.

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INTRODUCTION

In the last decade, inclusive education has become a global priority, aiming to ensure access to quality learning for all, including those with special needs (Suriaman, 2023; Zh et al., 2022). One key strategy is the integration of technology and adaptive learning methodologies (Ahmad, 2010; Zh et al., 2024), which enable customization of learning materials based on individual needs (Eau et al., 2019). Recent

systematic reviews confirm that digital technologies play a central role in personalized learning practices, highlighting their growing relevance for inclusive education (Varona-Klioukina and Engel, 2024). These approaches are increasingly relevant in today's technology-oriented educational landscape, supporting efforts toward educational equity and justice.

In this context, technology integration is essential to accommodate diverse learner needs and promote inclusivity (Zh et al., 2025). Inclusive education, which ensures equal access to learning (Irvan & Jauhari, 2018), requires adaptive strategies that acknowledge infrastructural limitations (Herawati, 2016). This is especially important when students' digital skills and beliefs about technology impact their engagement and success in personalized learning environments (Sanal Kumar and Thandeeswaran, 2023; Schmid and Petko, 2019). At SMP Al Ulum Medan, the Content Creator extracurricular program faces a specific challenge: many students cannot install Adobe Premiere Pro due to hardware limitations (Amarta et al., 2023; Nabella, 2022). While Adobe Premiere Pro is an industry standard tool, its compatibility with student devices is limited (Imam Mutaqin and Zaini, 2021), requiring alternative solutions to ensure participation.

As a response, students are given the flexibility to use editing applications compatible with their devices, such as CapCut, KineMaster, or Canva. This approach reflects adaptive education principles, where teaching methods are adjusted without altering learning goals (Hughey, 2020). Recent research suggests that leveraging learning analytics and nudging strategies can further increase students' engagement in video-based activities (Mitrovic et al., 2019; Dimitrova et al., 2017). However, there is a research gap regarding the implementation of adaptive learning in extracurricular or nonformal settings, particularly in creative and skill-based activities. While previous studies have focused on formal classrooms (Palanivel, 2020; Hughey, 2020), few explore how flexible technology choices affect outcomes in practical, inclusive learning environments. Moreover, new insights into video-based pedagogy show the importance of clear principles and tools for effective content creation (Gedera, 2021).

This study addresses that gap by systematically evaluating the effectiveness of software flexibility in the Content Creator extracurricular program. The approach emphasizes the integration of inclusive and adaptive strategies not only by utilizing available technologies but also by ensuring their meaningful use in diverse learning contexts (Toma and Reinita, 2023; Smith and Throne, 2020). Using lighter applications accessible on various devices is a key part of digital inclusion (Johnson et al., 2019), making this study a relevant response to the need for equitable and personalized digital education for all learners.

This challenge highlights the importance of allowing students to choose alternative software aligned with their device capabilities (Imam Mutaqin and Zaini, 2021). By adopting this strategy, all students can engage in learning activities without technological barriers, embodying the personalized learning model in practice (Lukianova and Komar, 2023). A systematic evaluation of this approach is necessary to determine its impact on improving students' video editing competencies while supporting an inclusive learning environment.

Designed as a quantitative study, this research applies statistical techniques such as pretest and posttest assessments, surveys, and skills evaluations to compare learning outcomes across different software tools. The data are analyzed using authentic assessments and t-tests to measure the effectiveness of adaptive education in promoting equity. The study hypothesizes that allowing flexible software use significantly enhances academic achievement in inclusive settings compared to traditional methods.

Through this approach, the study provides empirical support for the use of adaptive technology in inclusive learning environments. Specifically, it assesses how software flexibility in the Content Creator extracurricular program at SMP Al Ulum Medan enables students to develop digital content creation skills regardless of device limitations. The findings aim to inform future inclusive education practices by focusing not only on what is taught but also on how it is delivered in relation to available student resources.

MATERIAL AND METHODS

This study adopted an exploratory quantitative approach to evaluate the effectiveness of implementing adaptive technology in video editing learning at Al Ulum Junior High School in Medan. Data analysis was carried out using descriptive statistical techniques and paired sample t-tests, in accordance with standard procedures for evaluating pretest and posttest interventions in small group studies. Descriptive statistics, including mean and standard deviation, were used to summarize students' scores before and after the learning intervention (Nasution, 2017). The paired sample t-test was employed to determine whether there were statistically significant differences between students' video editing skills before and after being given the flexibility to choose video editing applications compatible with their respective devices.

The primary objective of this study was to assess the improvement of students' video editing competencies after the implementation of a personalized learning approach. Pretest and posttest instruments were administered through the Quizziz platform to assess students' cognitive and technical knowledge. These test results were then statistically analyzed to test the hypothesis that adaptive technology use leads to improved learning outcomes.

The sample consisted of 20 students who participated in the Content Creator extracurricular program and were selected using purposive sampling techniques. Selection criteria focused on hardware limitations that prevented the installation and effective use of Adobe Premiere Pro. To ensure equitable participation, students were encouraged to select alternative applications that matched their device capabilities. The distribution of application choices among the participants was as follows: InShot (5 students), CapCut (5 students), KineMaster (5 students), and Canva (5 students). While the sample size is relatively small, it is considered adequate for exploratory studies of this nature; however, generalizations should be made cautiously due to limited statistical power.

Data were collected through two main instruments: surveys and video editing skills tests. The surveys included a baseline questionnaire to capture demographic information and students' previous experience with editing tools, as well as a final survey to gather students' perceptions of the usefulness and usability of the software they used. The skills test was conducted before and after the intervention and evaluated students' performance using a scoring rubric that assessed key technical aspects of video editing, such as transitions, audio synchronization, visual coherence, and storytelling structure.

The instruments used in this study included questionnaires, scoring rubrics, and pretest-posttest assessments. Each test consisted of 10 items designed to measure knowledge and technical understanding of video editing. The scoring rubric provided standardized criteria to ensure consistency in evaluating the video projects submitted by students.

Data Interpretation

The following is a table containing the formulas used in descriptive statistical analysis and paired t tests, along with explanations and data interpretations based on the basis for decision making:

Table 1. Data Interpretations

No	Formula	Explanation	Data Interpretation Based on Decision Making Basis
1	Mean ($\bar{x}$)	$\bar{x}$ = (Σx)/n Where Σx is the sum of all scores, and n is the number of samples	The mean is used to determine the middle value of the data. If the post-test mean is higher than the pre-test mean, there is an improvement.
2	Standar Deviasi (SD)	SD = sqrt(($\Sigma(x - \bar{x})^2$)/n) Where x is each individual score, $\bar{x}$ is the mean, and n is the sample size.	Standard deviation measures the spread of data around the mean. A lower SD after the intervention indicates more consistent results.
3	Paired t-test	t = ($\bar{x}$d) / (SDd / sqrt(n)) Where $\bar{x}$d is the mean of the difference in pre-test and post-test scores, SDd is the standard deviation of the difference in scores, and n is the sample size.	The paired t-test is used to test the mean difference of two paired sets of data. If the p-value <0.05, the null hypothesis is rejected, indicating a significant difference between the pre-test and post-test.

Basis for Decision Making

1. Average (Mean)
   Decision: If the post-test mean is higher than the pre-test mean, it can be concluded that there is an improvement in skills after the intervention.
2. Standard Deviation (SD)
   Decision: A comparison of the SD of the pre-test and post-test gives an idea of the distribution of the data. A smaller SD in the post-test indicates a more consistent improvement.
3. Paired t-test
   Decision: If the p-value < 0.05, then we reject the null hypothesis (no difference) and accept the alternative hypothesis (there is a difference). This indicates that the increase in scores from pre-test to post-test is statistically significant.

RESULT AND DISCUSSION

Learning Design Development

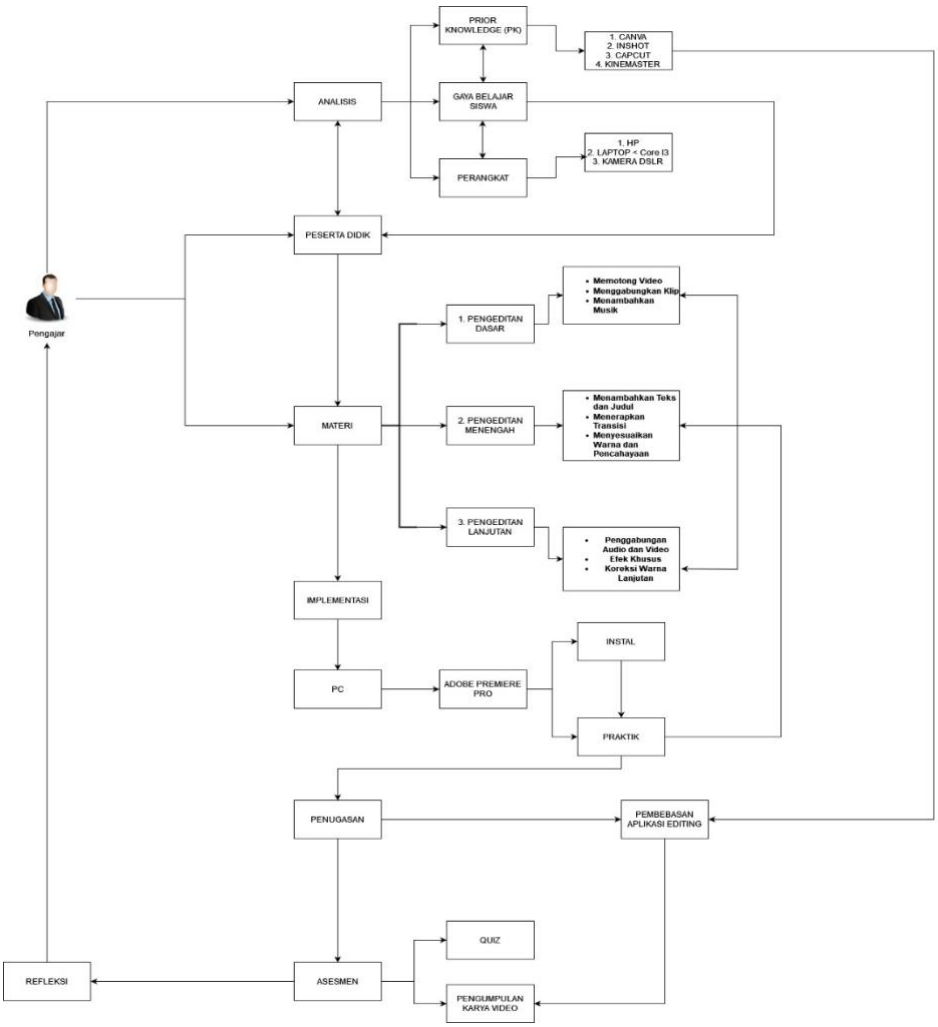

Figure 1. Flowchart of the Personalized Video Editing Learning Process

As shown in Figure 1, the learning process begins with an analysis phase where students' prior knowledge, learning styles, and available devices are identified. This phase informs the design of the learning materials, which are divided into three levels: basic editing, intermediate editing, and advanced editing. Basic editing covers fundamental skills such as cutting video clips, merging clips, and adding music. Intermediate editing focuses on adding text and titles, applying transitions, and adjusting color

and lighting. Advanced editing includes audio-visual merging and advanced color correction techniques.

Academic Interpretation of Learning Design with Personalized and Smart Pedagogy Approach

The diagram represents a comprehensive framework for designing learning that is tailored to the needs of learners/learners and utilizes the principles of smart pedagogy. The process is divided into phases, each with specific steps to ensure effective learning outcomes. Below is a detailed description of each phase:

As shown in Figure 1, the learning process begins with an analysis phase where students' prior knowledge, learning styles, and available devices are identified. This phase informs the design of the learning materials, which are divided into three levels: basic editing, intermediate editing, and advanced editing. Basic editing covers fundamental skills such as cutting video clips, merging clips, and adding music. Intermediate editing focuses on adding text and titles, applying transitions, and adjusting color and lighting. Advanced editing includes audio-visual merging and advanced color correction techniques.

The implementation stage involves the usage of PCs with Adobe Premiere Pro as the primary editing software, encompassing installation and hands-on practice. Following practical application, students complete assignments using various editing applications. Assessment comprises quizzes and video project submissions, which are then reviewed alongside instructor reflections to close the learning loop and guide further improvements

1. Analysis

   The first step in designing an effective video editing course is assessing learners' prior knowledge of tools such as CANVA, INSHOT, CAPCUT, and KINEMASTER. Understanding their existing skills helps in structuring lessons that build on what they already know. Additionally, evaluating their learning styles allows instructors to tailor teaching methods, ensuring that each learner can engage with the material in a way that suits their preferences and enhances comprehension.

   Another important aspect is identifying the devices available to learners, such as smartphones, laptops with at least a Core i3 processor, and DSLR cameras. This ensures that the course content and activities are compatible with their technology, allowing for a seamless learning experience. By aligning instructional strategies with both learners' prior knowledge and available resources, the learning process becomes more accessible, practical, and effective.

2. Material Development

   Material development for video editing is structured into three levels to ensure a progressive learning experience. The basic editing level focuses on fundamental skills such as cutting and combining video clips, as well as adding music. This stage provides learners with a solid foundation in essential editing techniques, enabling them to create simple yet cohesive videos.

   At the intermediate level, learners build upon their foundational skills by exploring more complex editing techniques. This includes adding text and titles, applying smooth transitions between clips, and making basic color and lighting adjustments. These skills are crucial for enhancing video quality and achieving a more polished, professional appearance.

   The advanced editing stage equips learners with sophisticated techniques to refine their video production capabilities. It covers critical aspects such as precise audio-video synchronization, the application of special effects, and advanced color correction. Mastering these skills allows learners to create high-quality videos suitable for professional and commercial purposes.

3. Implementation

   During the implementation phase, the initial step involved the installation of Adobe Premiere Pro on the learners' personal computers. This stage was crucial in ensuring that participants had access to industry-standard video editing software. However, technical constraints arose, as some learners faced difficulties in installing the application due to hardware limitations or system incompatibilities. To address this challenge, alternative software options were introduced, allowing participants to select tools that aligned with their technical capacities and personal preferences.

This adaptive approach ensured inclusivity and accessibility, enabling all learners to engage meaningfully with the training content.

Following the software installation process, learners proceeded to the hands-on practice stage, where they applied theoretical knowledge through direct engagement with video editing tasks. This experiential learning approach facilitated skill acquisition by immersing participants in practical exercises that mirrored real-world editing scenarios. By working with their chosen software, learners enhanced their technical proficiency while also developing adaptability in utilizing different editing platforms. Moreover, this stage reinforced the importance of problem-solving and creative decision-making, both of which are critical competencies in the field of digital media production.

To optimize learning outcomes, the hands-on practice sessions were supplemented with structured guidance and individualized feedback from instructors. This pedagogical strategy ensured that learners received targeted support tailored to their specific challenges and skill levels. Additionally, collaborative learning opportunities were encouraged, fostering peer-to-peer knowledge exchange and critical discussions on editing techniques. Through this comprehensive instructional approach, the training program aimed to equip learners with not only technical expertise but also the confidence and autonomy required to navigate the evolving landscape of video editing and digital content creation.

4. Assignments

In video editing education, assessment plays a crucial role in ensuring that learners develop both technical proficiency and conceptual understanding. One of the primary methods of assessment is task-based learning, where learners engage in various editing exercises that correspond to the skills taught at each level. These tasks are designed to be both individual and collaborative, enabling students to practice independently while also benefiting from peer feedback and group discussions. Collaborative editing tasks encourage teamwork and exposure to diverse editing styles, enhancing creativity and problem-solving skills. Furthermore, hands-on tasks simulate real-world scenarios, making the learning process more practical and industry-relevant.

In addition to task-based assessments, quizzes are integrated into the learning process to evaluate learners' comprehension of theoretical aspects and their ability to apply video editing principles. These quizzes test knowledge of fundamental concepts, such as editing techniques, transitions, color grading, and audio synchronization. Regular quizzes ensure that learners maintain a strong theoretical foundation, which is essential for effective practical application. By incorporating both multiple-choice and scenario-based questions, quizzes provide a balanced evaluation that captures both recall and critical thinking abilities. This approach enables instructors to identify areas where learners may need further support or additional instructional materials.

A comprehensive assessment strategy also includes authentic evaluation through video project submissions. Learners are required to create and submit edited video projects that demonstrate their ability to integrate various editing techniques into a cohesive final product. These projects are evaluated based on specific criteria, such as creativity, technical execution, narrative coherence, and adherence to industry standards. Authentic assessment provides a more accurate measure of learners’ competence as it focuses on their ability to apply skills in practical contexts rather than merely recalling theoretical knowledge. By using this method, educators can assess the overall proficiency of learners while also preparing them for real-world video editing challenges.

5. Assessment and Evaluation

Assessment is done through pretests and post-tests to measure the development of Learners' competencies. In addition, authentic assessment is conducted to comprehensively evaluate the quality of Learners' work.

6. Reflection

Reflective Evaluation: The final stage involves reflective evaluation, where the teacher assesses the effectiveness of the teaching methods and materials used. Feedback from learners is also collected to refine and improve future learning strategies.

The learning approaches adopted are smart pedagogy, where personalized learning and the use of adaptive technologies play a key role in overcoming learners' technical limitations. This structured approach ensures that Learners with varying levels of prior knowledge and different learning styles can develop video editing skills effectively. The instructor successfully created a responsive and supportive learning environment, allowing each Learner to learn according to their abilities and devices. This not only solves technical problems but also increases Learners' motivation and engagement in content creator learning.

Pretest and Post Test Data Analysis Results

To evaluate the impact of the personalized approach in video editing learning, a Paired Sample T-Test was conducted using IBM SPSS Statistics 27. This test was chosen to determine whether there is a statistically significant difference between the pre-test and post-test scores and to confirm whether the flexible use of software effectively improves students' digital competencies.

The expected result is that the post-test scores will be significantly higher than the pre-test scores, with a strong correlation between the two. However, it is recognized that this test, while robust, is limited by the relatively small sample size (N=20), which may affect generalizability.

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	57,5000	20	7,86398	1,75844
	Posttest	80,5000	20	7,59155	1,69752

As seen from the descriptive statistics, the mean score increased from 57.50(pre-test) to 80.50(post-test) That amount to an average increase of 23 points post-intervention. There are small standard deviations (7.86 and 7.59) and small standard error of mean (1.76 and 1.70) close to them, indicating that the data points are not very widely dispersed, which means that the performance of students in respective test is consistent across many students. This descriptive trend serves as preliminary support for the personalized approach of allowing students to choose editing software compatible with their devices resulting in improved learning outcomes.

The results suggest that this flexible video editing software intervention is effective in developing students' video editing skills. The growth in mean scores from pretest to post-test shows that this adaptive and personalized learning model is capable of improving the digital competencies of students. Hence, these findings provide a great validation for hypothesis stating that the adaptive usage of technology in learning possesses a impact on students' academic performance in inclusive education settings when compared to conventional learning process.

Table 3. Paired Samples Corelations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	20	0,815	0,000

It can be seen from the correlation coefficient which is equal to 0.815 that there is a high positive relationship between the scores of the students before and after from things from the pre-test and post-test. In other words, if a student scored well or poorly on the pre-test, they would most likely score well or poorly on the post-test, which further shows it wasn't random but something that students were experiencing consistently with each other. The significance value ($p = 0.000$) is smaller than 0.05, so it means that this positive correlation is statistically significant.

The significance of this finding bolsters internal validity, suggesting improvement is due to the effectiveness of the adaptive learning strategy and not chance. Therefore, this result is consistent with

the hypothesis, in which the intervention had a positive and significant impact on the quality of students' video editing skills. The significant relationship between the pretest and post-test also shows that whatever ability we have written through the measurement has really increased significantly.

Table 4. Paired Samples Test

Pair	Mean Difference (Pretest - Posttest)	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
1	-23.00000	4.70162	1.05131	-25.20043	-20.79957	-21.877	19	

The mean difference of 23.00 points indicates a clear improvement in student scores after the personalized learning approach was applied. The confidence interval ranging from 20.80 to 25.20 does not cross zero, which reinforces that the difference is significant. The t value of 21.877 with a degree of freedom of 19 and a significance value of 0.000 show that the improvement in scores is statistically significant at the 0.05 level. This result supports the hypothesis that flexible and personalized use of software has a positive effect on students' video editing skills.

The significant increase in scores and strong correlation confirm that personalized and adaptive strategies can help students overcome technological barriers to develop their digital competencies. This approach has practical implications for inclusive education, showing that students with limited device capabilities can still achieve meaningful learning outcomes.

However, some limitations should be noted. The small sample size and the single extracurricular context limit the generalizability of these findings. In addition, factors such as prior experience with editing tools and differences in device performance were not controlled in this study. Further research with larger samples and more diverse contexts is recommended to validate these results and explore their long-term impact.

CONCLUSION

This study demonstrates that implementing a personalized approach in video editing learning can effectively strengthen students' digital competencies as 21st-century learners. By allowing flexibility in the selection of video editing tools that align with students' device capabilities, the intervention successfully addressed technical barriers and enabled more equitable participation in digital skill development. The findings imply that adaptive and learner-centered strategies should be more widely integrated into digital learning practices to promote inclusivity and motivation among diverse student groups. This approach reinforces the importance of designing learning environments that are accessible, responsive, and able to accommodate varied technological resources.

However, the research was conducted with a limited number of participants within a single extracurricular program, which may influence the generalizability of the results. The study also focused solely on short-term outcomes and did not assess the long-term retention or transferability of digital editing skills. Future research should therefore explore larger and more diverse samples, include longitudinal measurements to capture sustained impacts, and investigate how personalized learning models can be scaled across different educational levels and contexts. Such efforts will help build a stronger evidence base for practical implementation of adaptive learning strategies in schools and community learning programs.

By highlighting the value of flexibility and personalization in skill-based learning, this study contributes to the growing discourse on inclusive education and digital equity. The insights gained can guide educators, curriculum developers, and policymakers in designing learning experiences that empower all learners to thrive in an increasingly digital world.

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