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Virtual reality video project design to improve vocational teachers' skills in implementing Kurikulum Merdeka

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ABSTRACT

This project aims to improve the skills of vocational teachers in implementing the Merdeka Curriculum, with the design of the Merdeka Curriculum virtual reality video project to encourage the use of a learner-centered approach and prioritize skills-based learning relevant to the world of work. VR video content is designed to improve vocational teachers' understanding and skills in implementing the Merdeka Kurikulum. The purpose of this research is to facilitate teachers to have pedagogical skills in preparing teaching materials to evaluate learning. The method in this research is Action research with the VR video content development process involving determining clear learning objectives, designing a VR curriculum, preparing VR materials and content, and making VR videos using relevant technology and software. Furthermore, VR video content is implemented in vocational teacher learning by providing access to VR devices and clear usage guidelines. Evaluation is conducted to measure the effectiveness of VR videos in achieving learning objectives and obtain feedback from vocational teachers. The results of this project show that using VR videos in vocational teachers' learning can improve their engagement, understanding, and skills in the context of the Merdeka Curriculum. Vocational teachers experience a more interactive and immersive learning experience through a realistic virtual environment. Students also benefit from using VR videos, with an increased understanding of vocational concepts and their readiness for the world of work. The project also faced some challenges, such as the accessibility of VR devices and technical constraints. In discussing the project results, it is recommended to collaborate with related parties and share experiences with the education community so that the use of VR videos in vocational learning can expand and continue to grow.

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INTRODUCTION

Vocational teachers must continuously develop themselves through training and courses relevant to their vocational field. Participating in training organized by educational institutions or related institutions will help vocational teachers keep up with the latest industry developments.

Vocational teachers can improve their competence by collaborating with fellow teachers or professionals. Through exchanging knowledge and experience, vocational teachers can broaden their understanding of the vocational field of learning.

The data obtained about the learning process in cultural arts at Vocational High Schools, there are still several problems, including: 1) The learning methods used by teachers are too oriented towards theoretical aspects and learning materials do not balance the achievement of students' cognitive, affective, and psychomotor competencies; 2) Not yet able to utilize school potential and integrate it into each basic art competency; 3) Students are not trained in the creativity of creating works of art 4) Students are more dependent on traditional art learning tools; 5) Learning resources are still limited (Yuara et al., 2019).

In terms of utilizing technology during the pandemic, many art activists made innovations so that they could still work amid the pandemic. Music performances must now be done virtually (Afifah et al., 2022). This learning project model is suitable for developing a deeper understanding of a particular topic or concept, improving critical and analytical skills, expanding cooperation and communication skills, and encouraging applying students' knowledge and skills learned in a real-world context. The model in project-based learning helps students in learning, namely knowledge and skills that are dense and meaningful (meaningful-use) built through authentic tasks and work, expanding knowledge through the authenticity of curricular activities that are accommodated by the learning process planned (designing) or open inquiry, with results or answers that are not predetermined by a particular perspective, and building knowledge through real-world learning experiences and negotiation of interpersonal cognition that takes place in a collaborative work atmosphere (Santi, 2011).

Regarding technology, learning projects can also utilize digital tools and resources to facilitate and extend learning—using apps or software to create presentations and virtual reality videos. Virtual reality refers to using intelligent reproduction for the benefit and opportunity of participating in visible conditions, such as natural objects and events, and the experience gained in the virtual world (Ghali et al., 2012). It is emphasized that learning is a communication process, in other words. Learning activities occur when there is communication between the recipient of the message (P) and the source (S) through the media (M). However, the communication process only occurs after a backlash (feedback). Based on the description above, it can be briefly stated that learning media is a vehicle for distributing learning messages or information (Syamsuri, 2020).

Exploration of technological fields is widely done to support the teaching of subjects (Chauhan, 2017). The innovation is the development of digital appreciation learning media with virtual reality videos (Efendi et al., 2021). Virtual reality is a technology that allows users to be in a virtual world and interact in it; it is a technology-based thing combining entry and exit devices, specifically so that users can interact in virtual reality. Students outside of class hours can use virtual reality-based multimedia learning media. Learning media can be used repeatedly and does not damage its objectivity.

The Virtual Reality (VR) video learning project for vocational teachers in implementing the Merdeka Curriculum is an exciting idea. This project can provide an interactive and immersive learning experience for vocational teachers to be better prepared for the challenges and requirements of the Merdeka Curriculum. Professional teachers must possess the competencies to carry out their duties and functions: teaching, educating, guiding, training, directing, assessing, and evaluating their students. Teachers must also master skills in adaptability to new technologies and global challenges (Yuara et al., 2019). Professionalism in question is a process that moves from ignorance to knowledge, from immaturity to maturity. Meanwhile, Glickman in Bafadal emphasizes that someone will work professionally if that person has the ability of professionalism if he has high ability and motivation to work (Fitriani et al., 2017).

Merdeka Curriculum is a term that is not very specific and may vary in context. However, when referring to the concept of education that provides more experience for students to direct their learning, some steps can be taken to implement the concept: Education adopts an independent campus curriculum. This curriculum emphasizes freedom and improving human resources and the quality of education. Education can start from primary education to higher education, so every level

is needed in the education that has been planned. Implementing quality education requires the availability of accuracy in processing the curriculum, as stated by Richard and McNeil, a very strategic role that determines the success of education. In line with that, curriculum development is necessary (Suwandi & Maret, 2020).

The purpose of this research is to facilitate teachers to have pedagogical skills in preparing teaching materials to evaluate learning. To prepare students in pedagogical terms. Pedagogical statements can direct students' experiences from something impartial and turn into something present (Sukmayadi, 2014).

Talking about effectiveness in learning needs to be managed and matched by a curriculum, as well as the role of the teacher. Achievement of competency is not only knowledge or skills, but also teachers are led to complex things. In other words, competence can be interpreted as an effort done correctly by someone who has mastered it. According to Law No. 14 of 2005, which regulates teachers and lecturers, competence between teachers and lecturers is identified as knowledge, skills, and attitudes that must be put forward in carrying out professional duties later (Andina, 2018).

Vocational teachers, in responding to the readiness of this industrial era, also cause other factors; teachers must equip students' abilities to face the 21st century (Yuara et al., 2019). This research is entitled A Learning Multimedia Project. To keep up with the development of digital technology that is very fast, it cannot be denied that traditional arts, especially dance, need to be juxtaposed with the latest digital technology. This problem has a connection between social (5.0) (Smart information) and industry (4.0) (Technology). In the current era, Generation Y has elementary school-age children; the generation years born are 1980 to 2000 (Hardianto & Wati, 2023). To increase the attractiveness of learning traditional dances, it is necessary to develop the latest media in learning.

Agreeing with the course of education in Indonesia, the concept of independent learning can be accepted in classroom learning, given the vision and mission of Indonesian education, for the creation of quality human beings who can compete in various fields of life (Sibagariang et al., 2021).

In digital learning media, technology is utilized in classroom learning. Teacher media plays a role in assisting students in understanding learning materials that, in realization, cannot be brought into the classroom, for example, far in the range of time and place (Fatimah & Bramastia, 2021).

In this study, the researcher focuses on developing vocational teacher skills for implementing the Merdeka Curriculum, which can include using new technologies such as Virtual Reality (VR) to provide a more interactive and immersive learning experience. Here is a step-by-step guide to developing a Virtual Reality video project in the implementation of the Merdeka Curriculum: Identify learning objectives: Determine the learning objectives you want to achieve through this VR project. For example, do you want students to understand certain concepts, develop specific skills, or explore new environments? With this country's advancement of technology and socio-cultural development, citizens can easily watch videos (Fadhli, 2016).

A selection of topics or subjects that are relevant to the curriculum and match the students' interests. For example, if you teach history, you can create a VR experience about a specific historical event. If you teach natural science, you can create a VR experience about an ecosystem or planet. Design a scenario: Create a scenario or story that will be implemented in the VR project. Plan the storyline, interactions, and challenges to be faced by the students in the virtual environment. Design the virtual environment: Use appropriate VR software to design the virtual environment. You can use VR development tools such as Unity or Unreal Engine. Design an environment that matches the topic or subject you have defined. Add interactions and challenges: Add interactive elements in the virtual environment to actively engage students. For example, students can solve puzzles, answer questions, or interact with objects in the virtual environment. Test and refine: Pilot the VR project with students to get feedback and make improvements. Evaluate how the VR project supports the learning objectives and identify areas that need improvement or enhancement.

Virtual reality is meant to be a powerful technology to simplify a real-world problem today. Virtual reality is a rapidly advancing technology with enormous potential to facilitate teaching and

learning for general educational purposes (Sun, Lin, & Wang, 2010). Implement it in the learning process, provide opportunities for students to live the VR experience, and discuss their learning outcomes. Evaluation and reflection: After implementation, evaluate the impact of the VR project on student learning. Check whether the learning objectives have been achieved and whether aspects need improvement or enhancement. In implementing the Merdeka Curriculum, it is essential to provide flexibility to students to choose VR projects that suit their interests and needs. Adequate support to ensure students can optimize the learning experience with the project.

This activity is essential in designing learning involving research elements such as experimentation, presentation, collaboration, and reflection. Learning projects aim to enable students to learn actively and engage in the learning process. Similarly, according to Wrigley (1998), Curtis (2005), and National Training Laboratory (2006), the discovery of a project-based learning model is quite helpful in making learning more effective so that it can adequately accommodate potential learning (Sastrika et al., 2013). Akbar (2013) says the learning process will run effectively if a teacher can utilize sources and media (Akbar & Holid, 2013).

In terms of realizing this project implementation, the Student Team Achievement Divisions learning model is a cooperative learning strategy that can be done by making the class into large groups with different backgrounds of student abilities. According to Rusman (2013), the STAD model was raised by Robert Slavin Johns at Hopkins University. According to Slavin (2013), STAD is a sufficient model for study groups. Explanation of cooperative learning with the STAD model: Students in groups have varying abilities (Hazmiwati, 2018). This model has five essential elements that are emphasized, namely:

1. Collaborate for a good thing, students interact and exchange abilities that aim to collaborate on their weaknesses and shortcomings in processing multimedia,
2. Face-to-face is an interactive thing through dance multimedia that is done,
3. Demanded independent responsibility in student learning for what has been discussed with their group friends,
4. Students are required to be skilled in actively socializing with fellow students to find solutions together,
5. The process is carried out in groups to achieve cooperation (Silaban & Sukmayadi, 2022).

In this context, the expected contribution of this research is to provide empirical evidence of the effectiveness of the STAD model in enhancing collaboration, social skills, and multimedia learning of students, as well as to offer practical guidance for educators in integrating this model into the implementation of the Merdeka Curriculum.

METHOD

Research methods can be used in the Virtual Reality (VR) Video learning project for vocational teachers to implement the Merdeka Curriculum. The research involves the researcher with the object of research, using an action research approach. Classroom action research is a research approach focused on improving and developing learning and teaching processes in the classroom. This research is conducted by teachers in their classroom environment to understand and improve learning practices and achieve better student results (Adelman, 1993). Action research by Lewin aims to find solutions to societal interaction developments (Aqib, 2008). This action research is not concerned with what the group will develop fundamentally, nor with the development starting from within (Suparno, 2008). All stages of the process require various scientific expertise and skills, which combine in a unified work team to produce a good design that can be operated flawlessly (Said, 2016).

This approach describes the objective conditions of vocational teachers' abilities in designing learning media developing teacher skills in designing virtual reality video projects with the results of improving teacher skills. Researchers are directly involved in the learning process and make sustainable changes based on the results of evaluation and reflection. Research Subjects: The research subjects are vocational teachers involved in implementing the Merdeka Curriculum. The selection of subjects was carried out by purposive sampling by considering the needs of the project

and the expertise of related vocational teachers. VR Video Content Development: VR video content development is carried out through the following stages:

1. Identify learning objectives that are specific and relevant to the Merdeka Curriculum,
2. Design of the VR curriculum, including the selection of concepts to be presented in a virtual environment,
3. Preparation of VR materials and content, including the collection of images, videos, or objects required for the creation of VR videos,
4. VR video creation using relevant software and technology.

VR video content is implemented in vocational teachers' learning using available VR devices. A clear user guide is provided to assist vocational teachers in using VR videos effectively. Observation is conducted to monitor vocational teachers' interaction with VR videos in responding to the use of this technology. Interviews were conducted to gain a deeper understanding of vocational teachers' experiences in using VR videos. The data collected was analyzed using a qualitative approach. Qualitative analysis was conducted by identifying patterns of findings in interviews and workshop observations. The research results are analyzed and discussed to identify the success of using VR videos in vocational teachers' learning in implementing the Merdeka Curriculum. Challenges faced and suggestions for further development are also discussed. This research method provides a holistic approach to describe the use of VR videos in vocational teacher learning. By actively involving vocational teachers in the research process, deep insights into the experience and impact of using VR videos in implementing the Merdeka Curriculum can be obtained.

RESULTS AND DISCUSSION

Results

Virtual Reality Video Project Design to Improve Vocational Teachers' Skills

In this Virtual Reality Workshop, the class action method is carried out by researchers to workshop participants or vocational teachers. Researchers provide stages in introducing Video Virtuality in art learning to improve Vocational Teacher skills. Vocational Teachers must determine the objectives in the learning offered by the researcher (VR Project), the teacher must determine which art concept (Dance) will be used as an example in the virtual reality video playback, and the Vocational Teacher must determine the choice of content to be created. The Vocational Teacher creates content until the editing stage and is presented and then shown to other workshop participants. This project emphasizes improving the skills of Vocational Teachers and collaboration from various disciplines such as Art, ICT, and Multimedia. The following in figure 1 and figure 2 are the content prepared by researchers in the Art learning workshop for vocational teachers.

Figure 1. VR Trial to Students

Figure 2. Youtube Endra toyan Pendet Dance 3600

However, in this virtual reality, researchers provide an overview of SWOT analysis. According to (Ratnawati, 2020), SWOT is a systematic identification of factors to formulate strategies; this analysis is based on logic in emphasizing multimedia's strengths and opportunities while minimizing weaknesses and threats (Ratnawati, 2020). SWOT analysis is carried out with the stages of data collection (internal and external conditions), data analysis, and decision-making (Taruna, 2017).

Strengths Regarding virtual reality, the strengths seen in the media are about current technology. Weaknesses In areas where technology is spread, especially in remote areas, there is still an uneven understanding of current media, user use must be regulated, and eye health needs to be regulated. Opportunities However, the most significant opportunity is that this media will become the current media so that Indonesian dance art will enter this virtual reality and can be known or known by people in the modernization area. Threats This media will continue growing, so human resources must be quickly matched.

1 Students must follow the learning process starting from learning traditional dance, ICT, Indonesian Language, and other subjects.
2 Students create study groups in class by determining the topic that will be made into a virtual reality project.
3 Students discuss the topic that will be made into a virtual reality project.
4 Students create virtual reality projects
5 Students are able to present the project using correct Indonesian language.

Figure 3. Schematic of the Learning Stages

The Virtual Reality Video Project is a collaboration between learning Cultural Arts (Dance), ICT, and Indonesian Language. Figure 3 is a schematic for completing projects in the class. It has to do with improving students' skills. James Kulik's research (Heinich, Molenda, Russell, & Smaldino, 1996, p. 217) stated that technology in learning, student achievement increased by 10-18%, the comparison is in conventional learning (Dosi & Budiningsih, 2019). There is a need to provide tools that can positively impact and be used as a communication medium in learning activities (Sihkabuden, 2011), as shown in Figure 4.

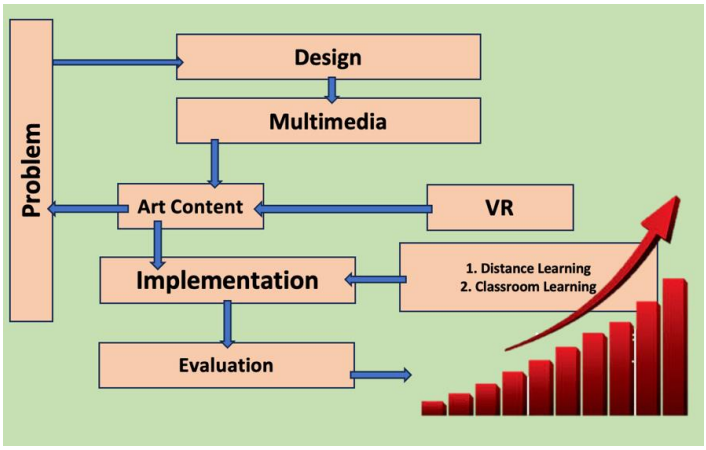

Figure 4. VR Project Schematic

C explains design as a design research procedure more broadly and in detail. Jones, in the book 'Design Method,' describes procedures for designing, which are shown in Figure 5:

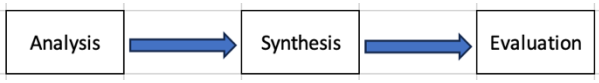

Figure 5. Design Research Procedure

In the analysis process, the designer's task is to identify and analyze all problems related to engineering, commercial, production, distribution, and ergonomic functions. In the synthesis process, the designer searches for and develops a model; it is then evaluated based on the desired objectives (Zainuddin, 1995).

Discussion

Implementation of the Merdeka Curriculum

The steps that can be considered in carrying out this project:

1. Identify learning objectives: Determine the objectives to be achieved through using VR videos in learning. Do you want to improve teachers' understanding of Merdeka Curriculum principles? Or do you want to provide a real-life simulation experience in a specific vocational environment? Define your objectives clearly so that the project can be well-directed.
2. Design the VR curriculum: Create a VR curriculum framework that includes the topics and competencies you want to deliver to vocational teachers. Determine the learning scenarios and activities that will be conducted in the virtual environment. For example, simulation of vocational practices, exploration of the work environment, or interaction with equipment and tools used in their work.
3. Prepare VR materials and content: Create VR content that matches your designed curriculum. Use VR authoring software or tools to create realistic and interactive 3D environments. If possible, also involve students in the VR content creation process to increase their engagement in learning.
4. VR video creation: Use a 360-degree camera or other VR recording tools to record videos used in this project. Ensure good video and audio quality to provide a satisfying experience for VR users. If you cannot access VR recording equipment, you can also use software to create VR videos from standard images and footage.
5. Implementation and evaluation: Provide access to VR devices, such as VR headsets, for vocational teachers to experience learning through VR videos. Make sure they have clear usage guidelines. After implementing the VR video, evaluate its effectiveness in achieving the

set learning objectives. Get feedback from vocational teachers and use the information to improve and refine future projects.

6. Deployment and sharing: If the project proves successful, consider sharing your experience and lessons learned with the education community. You could present the project in a seminar or conference or publish an article on using VR in vocational learning.

Be sure to consider the resources and budget you have available for this project.

Figure 6. Classroom scheme

Figure 6 is a Virtual Reality (VR) Video learning project for vocational teachers in implementing the Merdeka Curriculum; it is essential to do this. Teachers' skills must be improved, teachers must keep pace with increasing technological developments, and teachers must utilize existing technology/media. Teachers must have knowledge of technology/media that develops in education and education to become modern and contemporary teachers.

Learning effectiveness: Evaluate the extent to which the use of VR videos in learning has achieved the set objectives. Review whether vocational teachers successfully understand the principles of the Merdeka Curriculum and can apply them regarding the facilities and infrastructure that need to be considered in considering the achievement of the implementation of an independent curriculum with the availability of infrastructure. Facilities and infrastructure also support the successful implementation of the independent curriculum in the driving school. Complete facilities and infrastructure support implementing the independent curriculum in the driving school, especially in the availability of IT equipment. The driving school receives financial assistance to complete the availability of infrastructure that supports the independent curriculum (Rahayu et al., 2022).

According to an interview with vocational teacher participant Yusuf Rizal (31/05), Bandung, they are learning during the driving school program. In the Art Learning Workshop Activities for Vocational Teachers, the experience of participating in the workshop gained new knowledge in curriculum development, especially art in technological media, can be united and developed because usually the field of art only introduced its separate sub-fields of art such as dance, music, separate forms. Art learning is not this ancient but can be collaborated with the latest technology. The introduction of this media has been known for a long time. Art learning and VR multimedia can be implemented into classroom learning because it is related to schools, including those that are not strategized in watching less performing arts; by using VR, students can gain experience or appreciate it directly by using VR. Art learning using VR multimedia is very appropriate in implementing the independent curriculum because it is required to make types of learning outside the classroom in the independent curriculum points. VR multimedia will be used in class learning, even though infrastructure is limited in the material or subject of cultural art appreciation.

Miarso (2004) says that the effectiveness of learning is one of the quality standards of education and is often measured by the achievement of goals, or it can also be interpreted as accuracy in managing a situation, "doing the right things" (Rohmawati, 2015).

Figure 7. Art Learning Workshop for Vocational Teachers, VR Trial to Vocational Teachers

Figure 7. uses VR technology, which provides a more exciting and interactive experience compared to traditional learning methods. Vocational teachers feel more motivated to learn and develop skills through VR videos.

Competency improvement: Evaluate whether using VR videos has helped improve vocational teachers' competencies in certain aspects relevant to the Merdeka Curriculum. Review whether they gain a deeper understanding of vocational materials, work skills, or problem-solving through the VR experience.

Benefits to students: Discuss the impact of using VR videos in vocational teacher learning on student progress. Whether VR technology improves student skills, a better understanding of concepts, or increased readiness for the world of work, evaluate whether VR videos can help students better prepare for the demands of the Merdeka Curriculum.

Challenges and suggestions: Identify the challenges faced during project implementation and how you overcame them. Review technical aspects, accessibility of VR devices, or other constraints that may have affected the project's success. Also, discuss suggestions and recommendations to improve the future use of VR videos in vocational learning.

Dissemination and collaboration: Discuss ways of disseminating the project results to the broader community of vocational and education teachers. Share your experience through publications, seminars, or conferences. Discuss potential collaborations with other parties, such as educational institutions, industry, or related communities, to further develop the use of VR videos in vocational learning.

CONCLUSION

Conclusion in Virtual Reality Video Project Design to Improve Vocational Teachers' Skills in Implementing the Independent Curriculum. Virtual Reality (VR) effectively improves vocational teachers' skills in implementing the Merdeka Curriculum. Using VR, teachers can practice interactively and realistically in simulating real situations in the field. The VR video project provides vocational teachers with an immersive and engaging learning experience. They can engage directly in teaching and get instant feedback, which helps improve their skills and confidence. VR videos also facilitate self-directed learning for vocational teachers. They can access training materials anytime and anywhere, thus increasing flexibility and convenience in the learning process. The design of VR video projects should be based on a comprehensive needs analysis of vocational teachers. Aligning the content and simulation scenarios with the real challenges teachers face in implementing the Merdeka Curriculum is critical to success. Developing VR video projects requires collaboration between technologists, instructional designers, and vocational education practitioners. The synergy of various expertise will result in an optimal learning experience. The VR video project should be evaluated periodically to measure its

impact and effectiveness on improving vocational teachers' skills. Feedback from teachers and students should also be taken to improve and refine the project continuously. Using VR in vocational education also opens opportunities to develop more engaging and interactive learning content for students. Teachers can create an innovative learning environment and support students' skill development by the demands of the curriculum. In conclusion, the use of Virtual Reality technology in video projects to improve vocational teachers' skills in implementing the Merdeka Curriculum is an innovative step that has the potential to have a positive impact on improving the quality of vocational education and preparing students to face the challenges of an increasingly complex world of work.

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