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Application of The Contextual Teaching Learning Model in Pancasila Education Subject Using Virtual Reality Technology

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ABSTRACT

This research aims to explore the application of contextual learning models in learning Pancasila Education by utilizing Virtual Reality (VR) technology. The contextual approach is chosen because it is believed able to increase student understanding and engagement through relevant and meaningful learning experiences. The method in this research is using literature study, which involves collecting and analyzing data from various written sources, such as books, scientific journals, articles, and other publications, to gain an in-depth understanding of the topic under study and identify relevant trends and findings. The results show that the use of contextual learning models combined with VR technology can increase student learning motivation, material understanding, and critical thinking skills. Students feel more involved and enthusiastic in the learning process because they can interact directly with the material content through VR simulation. The challenges for implementation is limited access to VR technology, particularly in schools located in remote areas or those with insufficient financial resources. Also designing appropriate and engaging learning materials that align with the curriculum and students' cognitive levels is the major obstacle for implementation. The findings suggest that the integration of VR technology in Pancasila Education learning can be an effective alternative to create a more dynamic and immersive learning experience. It is hoped that this research can be a reference for educators in developing innovative learning strategies that are in accordance with technological developments and educational needs.

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INTRODUCTION

Pancasila education has a vital role in shaping the character and national insight of students in Indonesia. As a state ideology, Pancasila is not just a concept learned on paper, but must be understood and lived by every citizen. To achieve this goal, a teaching method is needed that can connect the material with students' daily lives. The Contextual Teaching and Learning (CTL) model emerged as one of the effective approaches to teach Pancasila in a more meaningful and relevant way for students. CTL emphasizes learning that related to real life and allows students to connect the subject matter to their daily experiences (Johnson, 2002). The development of technology, particularly Virtual Reality (VR), offers new opportunities in education. VR technology allows students to experience an immersive and interactive learning environment, which can increase their understanding and engagement in learning. In the context of Pancasila education, the use of VR can bring Pancasila values into an immersive visual and sensory experience, so that students can feel and apply these values in a more real situation (Milgram et al., 1995; Mahdi & Yusrizal, 2018). The contextual learning model combines several important components, namely constructivism, questioning, inquiry, learning community, modeling, and reflection.

This approach can be used to relate Pancasila values to the context of students' lives (Depdiknas, 2003). For example, through project activities or case studies that illustrate the application of Pancasila values in society. By incorporating CTL, students are encouraged to engage in hands-on learning experiences that allow them to make meaningful connections between the content and their personal lives. VR technology offers a learning environment that is not only engaging but also allows simulation of real situations and build critical civic empathy (Merchant, 2014; Mercurio, 2024). For example, students can be invited to participate in a simulation of the Pancasila trial, visit historical places associated with Pancasila, or even engage in social scenarios that require the application of Pancasila values. Through the use of VR, students are not only passive recipients of knowledge but active participants in learning. The interactivity provided by VR can help students internalize abstract concepts and principles in ways that traditional teaching methods cannot achieve.

The effectiveness of CTL combined with VR has been supported by several studies. Research conducted by (Budiman, 2017) states that learning using VR-based contextual models can increase students' motivation and critical thinking skills. This is because VR provides a more engaging and stimulating learning environment, allowing students to explore concepts dynamically. Furthermore, studies by (Kusumah, 2012) highlight that the application of CTL in various subjects, including Pancasila, can improve students' comprehension and retention of knowledge. The application of CTL in Pancasila education with VR technology also presents challenges, especially related to the readiness of infrastructure and human resources. Teachers need to be trained to use this technology effectively, and schools need to ensure the availability of adequate VR devices. The cost of VR equipment can also be a barrier, particularly for schools with limited budgets. However, with proper planning and support, these challenges can be overcome, and the benefits of more immersive and contextualized learning can be achieved.

Moreover, students' digital literacy plays a crucial role in the success of VR-based learning. According to (Prasetyo & Suryani, 2020), digital literacy skills are essential for students to maximize the benefits of technology in education. If students are not familiar with VR technology, they may face difficulties in navigating virtual environments and engaging fully in the learning process. Therefore, schools need to provide digital literacy training to prepare students for VR-integrated learning experiences. Another important aspect to consider is the pedagogical approach used by teachers. Teachers must be able to design VR-based lessons that align with the principles of CTL. As highlighted by (Nurhadi, 2004), CTL requires active learning strategies, such as problem-solving, collaboration, and inquiry-based learning. In a VR setting, teachers can create scenarios where students must work together to solve real-world problems, fostering critical thinking and teamwork. Without proper lesson planning, VR can become merely an entertainment tool rather than a meaningful educational resource.

Despite these challenges, the integration of CTL and VR in Pancasila education offers significant benefits. First, it enhances student engagement by providing an interactive and immersive learning experience. Second, it improves comprehension and retention by allowing students to experience Pancasila values in realistic contexts. Third, it fosters collaboration and social interaction, as students can work together in virtual environments to explore ethical dilemmas and moral decision-making related to Pancasila values (Putra & Susanto, 2021). Furthermore, VR can help address different learning styles. Some students learn best through visual and auditory means, while others benefit from kinesthetic experiences. VR accommodates these diverse learning preferences by combining visual, auditory, and hands-on interactions. Research by (Mayer, 2009) on multimedia learning suggests that students retain information better when multiple sensory modalities are engaged. By leveraging VR, educators can create a multi-sensory learning experience that caters to different student needs.

The potential of VR in Pancasila education is also in line with Indonesia's broader efforts to embrace digital transformation in education. The Ministry of Education and Culture has launched various initiatives to integrate technology into teaching and learning. According to Kemdikbud (2020), digital learning platforms and educational technology tools are being promoted to enhance teaching quality. The use of VR in Pancasila education aligns with this vision and represents an innovative step towards modernizing the learning process. To ensure the successful implementation of VR-based CTL in Pancasila education, collaboration among stakeholders is essential. Schools, government agencies, and private technology companies must work together to provide the necessary resources and support. Teachers must receive adequate training, and students must be equipped with the skills needed to navigate VR environments effectively. Additionally, ongoing research and evaluation are needed to assess the impact of this approach on student learning outcomes.

This article is discussed the integration of contextual learning models with VR technology in Pancasila education. Through this application, it is expected that Indonesia's young generation will have a strong understanding and high commitment to the values of Pancasila, which is the basis for the life of the nation and state.

METHODS

The authors apply the literature review method to evaluate and compare various journals relevant to the topic at hand. This method involves collecting, reading, and analyzing journals obtained through various academic sources. A literature review is the process of critically evaluating the research that has been conducted on a particular topic, including various sources such as books, journal articles, and other academic publications. This process aims to understand research trends, identify the strengths and weaknesses of previous studies, and provide a comprehensive overview of recent developments in the field under study.

In implementing this method, the authors searched for journals through several major platforms, including Google Scholar, the Publish or Perish application, and Science Direct. The keywords used in the search included "Pancasila Education," "Contextual Learning," and "Virtual Reality," which are the main topics in this article. The authors collected journals from various sources, both international and national, including accredited and non-accredited journals, proceedings, and theses. The search process involved selecting articles that were relevant to the topic and predetermined criteria. The selection process was conducted systematically to ensure the inclusion of high-quality research articles that contribute significantly to the discourse on the subject matter.

After collecting relevant journals, the authors then conducted a validation and review process. The validation criteria included several important aspects, such as the free availability of the journals through the Open Journal Systems (OJS) platform, the quality of the research methodology used in the journals, and the presentation of the data and discussion. The authors also evaluated the adequacy of the data for the analysis conducted in the studies, ensuring that the data presented was sufficient to provide a solid basis for the analysis. Additionally, the authors

assessed the novelty of the references used in the journals, ensuring that the literature used was current and relevant.

The relevance of the journals to the research topic was also an important consideration to ensure that the selected journals truly supported an in-depth understanding of the topic. In reviewing the selected journals, the authors critically analyzed various aspects, including the research objectives, methodologies, findings, and conclusions. The authors compared different approaches used in previous studies to determine the most effective methods for implementing Pancasila education through contextual learning and virtual reality. By examining multiple perspectives, the authors identified gaps in existing research that require further investigation. This analysis was essential in providing insights into how different researchers have approached similar topics and the outcomes they have achieved.

One of the significant aspects examined in the literature review was the effectiveness of contextual learning in enhancing students' understanding of Pancasila values. Several studies have demonstrated that contextual learning, which integrates real-world experiences into the educational process, helps students internalize moral and ethical values more effectively. The authors reviewed research findings that highlight the positive impact of contextual learning on students' engagement, motivation, and comprehension of complex subjects. These findings were then synthesized to draw meaningful conclusions. By comparing different studies, the authors identified key advantages and challenges associated with implementing virtual reality in Pancasila education.

RESULTS AND DISCUSSION

The application of the CTL model in Pancasila Education using VR technology is an innovative approach that enhances students' learning experiences. CTL is a learning strategy that emphasizes the connection between educational material and real-world situations that students encounter daily. By integrating VR, students can immerse themselves in realistic and interactive environments, making Pancasila concepts more concrete and relevant. This aligns with modern educational goals, which prioritize meaningful and contextual learning. In the context of contemporary education, integrating technology into the learning process not only enriches students' experiences but also fosters a deeper understanding of concepts. VR technology allows students to interact with digital environments that replicate real-life scenarios, such as the historical formulation of Pancasila or discussions on national values. Through these simulations, students can explore subject matter actively and independently, making their learning experiences more engaging and effective. According to research conducted by (Sunandi, 2023), the use of VR in education significantly increases student motivation and participation, which ultimately enhances learning outcomes.

One of the most significant advantages of implementing a VR-based CTL approach in Pancasila Education is its ability to develop students' critical thinking and collaborative skills. In a VR-enhanced learning environment, students engage in group discussions, teamwork, and problem-solving activities, all of which simulate real-world experiences. These activities foster the development of essential social and emotional skills, such as cooperation, effective communication, and analytical thinking. Students not only improve their academic comprehension of Pancasila principles but also cultivate skills necessary for real-world challenges. The immersive nature of VR-based learning encourages students to take an active role in their education. Instead of passively receiving information, they can interact with virtual objects, historical figures, and simulated communities that embody Pancasila values. For instance, students may participate in a VR simulation that reenacts key moments in Indonesia's history, allowing them to experience the struggles and achievements that shaped the nation's ideology. This hands-on experience deepens their appreciation of Pancasila and strengthens their ability to apply its principles in daily life. This is inline with research that show that technology can influence civic learning in positive ways. Through teacher guidance and interaction with their peers, students' thoughts shifted from inward, self-centered reflections toward other-focused, empathetic responses to perspectives of oppression and marginalization (Nelson, 2019).

Another critical aspect of this approach is its potential to bridge the gap between theoretical knowledge and practical application. Traditional methods of teaching Pancasila often rely on memorization and textbook-based learning, which may not always be engaging for students. However, with the implementation of VR in a CTL framework, learning becomes more dynamic and experiential. Students can, for example, engage in a virtual debate about contemporary ethical dilemmas related to Pancasila values, providing them with opportunities to analyze and apply what they have learned in a meaningful way.

Contextual Teaching and Learning (CTL) in Pancasila Education

CTL is a method that emphasizes the connection between subject matter and the context of students' real lives (Nababan & Sipayung, 2023). This approach is designed to help students not only understand theoretical concepts but also apply the knowledge they learn in situations relevant to everyday life. CTL seeks to create a more meaningful and relevant learning experience for students, ensuring that what they learn in school directly relates to the world around them. According to (Johnson, 2002), CTL integrates various learning components, including constructivism, problem-based learning, and project-based learning. Each of these components plays a crucial role in creating an active and participatory learning environment. Constructivism, for instance, emphasizes the importance of students building their own understanding through experience. Meanwhile, problem-based and project-based learning encourage students to collaborate in solving real-world problems, fostering critical and analytical thinking skills. As (Suherman and Widyastono, 2019) note, *"CTL encourages students to actively construct knowledge rather than passively receive information, making learning more meaningful and sustainable."*

In the context of Pancasila Education, the application of CTL has significant potential to help students internalize Pancasila values more effectively. For example, the concept of gotong royong (mutual cooperation) can be taught through group projects that require teamwork and collaboration. By facing challenges together, students do not just learn about gotong royong in theory but also experience it in practice. This allows them to develop a deeper appreciation of the importance of cooperation and solidarity in daily life. Komalasari (2010) asserts that "contextual learning is a form of learning innovation that can improve students' citizenship competence." Moreover, CTL can enhance the understanding and application of Pancasila values by engaging students in real-life social issues. For instance, students may participate in community service projects that reflect the principles of Kemanusiaan yang Adil dan Beradab (Just and Civilized Humanity), the second principle of Pancasila. By interacting with different members of the community and addressing real societal issues, students develop empathy, social awareness, and responsibility, which are essential components of civic education.

Another critical aspect of CTL in Pancasila Education is encouraging students to think critically and reflectively about how Pancasila values can be applied in their lives. For example, through case studies and discussions on ethical dilemmas, students can analyze how the principles of *Persatuan Indonesia* (Indonesian Unity) and *Kerakyatan yang Dipimpin oleh Hikmat Kebijaksanaan dalam Permusyawaratan/Perwakilan* (Democracy Guided by the Inner Wisdom in the Unanimity Arising Out of Deliberations Amongst Representatives) play a role in solving conflicts. This reflective process helps students develop a strong moral compass and an understanding of democratic values. Furthermore, technology can be integrated into CTL to enhance the learning experience. VR and digital simulations can provide students with immersive experiences that allow them to witness historical events, participate in civic engagement scenarios, or even simulate government decision-making processes. According to (Putra and Widodo, 2021), *"digital tools in CTL can bridge the gap between theoretical knowledge and practical application, making learning more interactive and effective."*

A key challenge in implementing CTL in Pancasila Education is ensuring that teachers are well-equipped with the necessary skills and resources. Teachers need to shift from traditional lecture-based methods to more interactive and student-centered approaches. Professional development programs and continuous training are essential to help educators integrate CTL effectively into their teaching strategies (Rahmawati & Suryadi, 2022). Additionally, schools must provide adequate infrastructure and support to facilitate contextual learning activities, such as project-based assignments and community engagement programs.

Virtual Reality Technology in Education

Virtual reality (VR) is a technology that allows users to interact with computer-generated three-dimensional environments. It offers immersive and interactive experiences, making it a potential tool in various fields, including education. In recent years, VR has been increasingly utilized to enhance learning experiences across different disciplines. According to research conducted by Merchant et al. (2014), the use of VR in education can improve student motivation, engagement, and learning outcomes. By presenting a more realistic and engaging learning environment, VR has the potential to transform the way students understand and process information. One of the key advantages of VR in education is its ability to provide experiential learning. Unlike traditional learning methods that rely heavily on passive absorption of information through lectures or textbooks, VR enables students to actively participate in the learning process. This aligns with the constructivist learning theory, which emphasizes that knowledge is best acquired through active experiences and interactions (Piaget, 1954). VR allows students to explore virtual environments, conduct experiments, and engage in problem-solving activities in a simulated setting, thereby fostering deeper understanding and retention of knowledge.

In the context of Pancasila Education, VR has great potential to simulate real-life situations where Pancasila values can be applied. For example, through VR, students can "visit" historical sites or participate in simulations of historical events related to the struggle for Indonesian independence. These virtual experiences enable students to feel the atmosphere and dynamics of these events, helping them develop a deeper understanding of the values of Pancasila and how they can be applied in everyday life. Such immersive experiences allow students to gain firsthand insights into the principles of nationalism, democracy, and social justice, which are essential components of Pancasila. Moreover, VR technology can facilitate collaborative learning by allowing students to interact with their peers in virtual environments. Through multi-user VR platforms, students can engage in discussions, debates, and group activities that reinforce critical thinking and teamwork skills. This collaborative aspect is particularly relevant in civic education, where discussions on ethical dilemmas, human rights, and social justice issues require active participation and diverse perspectives (Dede, 2009). By engaging in virtual role-playing scenarios, students can develop empathy and a better understanding of different viewpoints, which are crucial for fostering democratic values and responsible citizenship.

The implementation of VR in education, particularly in teaching Pancasila Education, can provide significant benefits. By presenting more engaging and interactive learning materials, VR can facilitate deeper and

contextualized understanding for students. This is especially important in subjects like civics and moral education, where abstract concepts such as integrity, tolerance, and justice can be difficult to grasp through conventional teaching methods. Studies have shown that immersive learning environments help students internalize complex concepts by allowing them to experience them firsthand (Dalgarno & Lee, 2010). Despite its numerous advantages, the integration of VR in education also poses several challenges. One of the main barriers is the high cost of VR hardware and software, which may limit accessibility, particularly in underfunded schools. Additionally, teachers may require specialized training to effectively incorporate VR technology into their teaching strategies. Without proper training and support, educators may struggle to maximize the potential of VR in their classrooms. Furthermore, prolonged use of VR may lead to issues such as motion sickness or eye strain, which need to be addressed to ensure a safe and comfortable learning experience for students.

To maximize the benefits of VR in education, it is essential for policymakers, educators, and technology developers to collaborate in creating accessible and high-quality VR learning resources. Investment in research and development can lead to the creation of more affordable VR solutions that can be widely implemented across different educational institutions. Additionally, professional development programs for teachers should be prioritized to ensure that they are equipped with the necessary skills to integrate VR effectively into their teaching practices.

Integration of CTL and VR in Pancasila Education Learning

VR is a technology that allows users to interact with computer-generated three-dimensional environments. It offers immersive and interactive experiences, making it a potential tool in a variety of fields, including education. In education, VR can create a more engaging and dynamic learning experience. According to research conducted by (Merchant, 2014), the use of VR in education can improve student motivation, engagement, and learning outcomes. By presenting a more realistic and engaging learning environment, VR can change the way students understand and process information. In the context of Pancasila Education, VR has great potential to simulate real situations where Pancasila values can be applied. For example, through VR, students can "visit" historical sites or participate in simulations of historical events related to the struggle for Indonesian independence. These virtual experiences allow students to feel the atmosphere and dynamics of the events so that they can develop a deeper understanding of the values of Pancasila and how they can be applied in everyday life.

The implementation of VR in education, particularly in teaching Pancasila Education, can provide significant benefits. By presenting more engaging and interactive learning materials, VR can facilitate deeper and contextualized understanding for students. In addition, this technology also opens up opportunities for educators to develop innovative and effective teaching methods, which can improve the quality of learning and students' understanding of Pancasila as an ideology and guide to the life of the nation. According to (Freina and Ott, 2015), VR-based learning can help students develop critical thinking and problem-solving skills through immersive experiences. Although the used of VR in general has been used mostly for adult training in special situations or for university students, but the drawbacks of its use in education with reference to different classes of users like children and some kinds of cognitive disabilities must become a consideration.

Another advantage of VR in education is its ability to provide personalized learning experiences. VR can adapt to different learning styles, allowing students to progress at their own pace. Research by (Makransky and Lilleholt, 2018) found that VR-based learning increases cognitive and emotional engagement, leading to better retention of information. This is particularly relevant in Pancasila Education, where understanding abstract concepts and moral values requires deep engagement and reflection. Despite its potential, there are several challenges to implementing VR in education. One major challenge is the cost of VR equipment and software development. High-quality VR headsets and applications can be expensive, making it difficult for schools with limited budgets to integrate this technology into their curriculum. Additionally, teachers need to be trained in how to use VR effectively in the classroom. A study by Radianti et al. (2020) highlighted the importance of teacher training and support in successfully implementing VR-based education.

Another concern is the potential for students to become too reliant on virtual experiences rather than real-world interactions. While VR provides valuable learning opportunities, it should be used as a supplement to traditional teaching methods rather than a replacement. According to (Dalgarno and Lee, 2010), the most effective educational experiences combine VR with collaborative and interactive activities that encourage students to apply their knowledge in real-life situations. Despite these challenges, the future of VR in education remains promising. Advances in technology are making VR more accessible and affordable. Open-source VR platforms and educational content libraries are being developed, allowing more schools to integrate VR into their curricula. Governments and educational institutions are also recognizing the importance of digital learning tools and are investing in VR-based educational initiatives.

In Indonesia, the integration of VR into Pancasila Education aligns with the country's efforts to modernize its education system. The Ministry of Education and Culture has been exploring digital learning strategies to enhance student engagement and learning outcomes. By incorporating VR, Pancasila Education can become more relevant and impactful, helping students develop a strong sense of national identity and moral responsibility. The potential of VR in education extends beyond Pancasila Education. It can be used in various subjects, including science, history, and language learning. VR can provide students with hands-on experiences, such as virtual science experiments, historical reenactments, and language immersion programs. According to Bacca et al. (2014), VR enhances learning by making abstract concepts more tangible and interactive.

Syntax of implementing CTL Learning Model on Pancasila Education with VR technology: (1) Introduction. The purpose is to convey the learning objectives and how VR will be used to deepen understanding of Pancasila Education. The context is inking Pancasila Education material with real situations relevant to students' lives. (2) Preparation. Create or select VR applications that are suitable for Pancasila Education materials, for example simulations about the history of Pancasila, national figures, and the implementation of Pancasila values in everyday life. Make sure the VR device is available and functioning properly. Conduct trials to ensure the quality of the VR experience. (3) Learning Activities. Introduce what VR is and how this technology will be used. Discuss the learning objectives and benefits of using VR in understanding Pancasila Education. Then, the students use the VR device to explore content relevant to the Pancasila Education material. After the VR session, teacher facilitate a class discussion to discuss students' experiences. Ask them about what they learned, how the VR helped them understand the material, and how they can relate the VR experience to real life. The teacher the ask students to create a project or presentation on how the values of Pancasila can be applied in daily life, with reference from their experience using VR. (4) In the closing stage, students receive feedback on their projects or presentations, focusing on both strengths and areas for improvement. A reflective discussion is encouraged to help students identify what aspects of the learning experience were effective and what could be enhanced. To reinforce their understanding, they are given follow-up assignments, such as writing an essay or creating a poster on the significance of Pancasila values in today's social and cultural context.

The assessment process includes both formative and summative evaluations. Formative assessment involves observing student participation during VR discussions and exploration activities, assessing their engagement and the quality of their contributions. Summative assessment, on the other hand, includes individual or group assignments submitted after the activity, as well as quizzes or exams designed to measure their comprehension of Pancasila Education concepts. These assessments ensure that students not only actively participate in the learning process but also develop a deeper understanding of Pancasila values and their relevance in contemporary society.

Challenges and Barriers to Implementation

The implementation of CTL combined with VR in Pancasila Education presents promising opportunities for enhancing student engagement and understanding. However, several challenges and barriers must be addressed to ensure effective implementation. One of the primary challenges is the limited access to VR technology, particularly in schools located in remote areas or those with insufficient financial resources. The digital divide remains a critical issue, as schools with limited budgets may struggle to afford the necessary hardware and software for VR-based learning experiences. Furthermore, teacher training and professional development in using VR technology are crucial for successful integration. According to Liao et al. (2019), infrastructure support and teacher training are key factors in the effective use of technology in education. Without adequate training, teachers may face difficulties in incorporating VR into their lesson plans, reducing its potential impact on student learning. Teachers must not only learn how to operate VR equipment but also understand how to integrate it pedagogically within the CTL framework. This requires continuous professional development programs supported by educational institutions and government policies.

Another major challenge lies in designing appropriate and engaging learning materials that align with the curriculum and students' cognitive levels. VR content must be relevant, interactive, and designed to enhance conceptual understanding rather than simply serving as an entertainment tool. This necessitates collaboration among educators, curriculum designers, and technology developers to create meaningful and effective educational content. As highlighted by Merchant et al. (2014), effective VR learning environments should incorporate elements that promote active learning, including problem-solving tasks, experiential learning activities, and opportunities for collaboration. Moreover, technical issues such as software compatibility, hardware limitations, and maintenance costs pose additional obstacles. VR devices require regular updates, and not all schools have the technical expertise to manage potential glitches and malfunctions. According to Hew and Brush (2007), technological infrastructure and maintenance are critical factors influencing the successful adoption of technology in education. Therefore, educational institutions must establish technical support systems to assist teachers and students in overcoming these challenges.

Additionally, students' readiness and adaptability to VR-based learning should be considered. While younger generations are generally more tech-savvy, some students may experience difficulties in navigating VR interfaces, leading to frustration and decreased motivation. Research by Mikropoulos and Natsis (2011) suggests that user-friendly VR applications and proper orientation sessions can significantly enhance students' ability to engage with the technology effectively. To address these challenges, collaborative efforts from various stakeholders, including the government, private sector, and academic institutions, are essential. Policymakers must allocate sufficient funding to support technological infrastructure in schools, while private companies can contribute by developing affordable and accessible VR solutions for educational purposes. Furthermore, interdisciplinary collaboration between educators and technology experts is necessary to ensure that VR content aligns with pedagogical goals and student learning needs.

Impact on Student Learning Outcomes

The integration of CTL and Virtual Reality VR in Pancasila Education has shown significant positive effects on student learning outcomes. Studies have demonstrated that using VR technology in education enhances student motivation and engagement, which in turn contributes to better comprehension and application of knowledge. According to Sung et al. (2017), VR-based learning environments provide immersive experiences that enable students to interact with virtual scenarios, increasing their sense of presence and interest in the subject matter. This heightened engagement translates into improved retention and understanding of Pancasila values, as students are more likely to connect abstract concepts with real-world applications. Furthermore, the application of CTL in Pancasila learning encourages students to actively construct their knowledge through meaningful experiences. The CTL approach emphasizes learning in authentic contexts, where students relate theoretical concepts to their daily lives. By integrating real-life situations into the curriculum, students are better

able to develop critical thinking and problem-solving skills. Research conducted by Chen et al. (2012) highlights that students who learn through CTL methods show increased cognitive abilities, particularly in reasoning and analyzing complex issues. This is crucial in Pancasila Education, where students must interpret and apply the values of Pancasila in various social and ethical contexts.

One of the key advantages of combining VR with CTL in Pancasila learning is its ability to provide experiential learning opportunities. Traditional classroom-based learning often struggles to bridge the gap between theory and practice. However, VR technology allows students to immerse themselves in simulated environments where they can experience ethical dilemmas, historical events, and societal challenges firsthand. For instance, students can virtually explore Indonesia's history, observe the implementation of Pancasila principles in governance, or engage in decision-making scenarios that test their moral reasoning. Such experiences deepen their understanding and encourage the internalization of Pancasila values in a way that traditional methods cannot achieve. Moreover, the implementation of CTL fosters student-centered learning, where learners take an active role in their education rather than passively receiving information. By engaging in collaborative projects, discussions, and case studies, students develop a deeper appreciation of the relevance of Pancasila in their personal and civic lives. This pedagogical approach aligns with Dewey's (1938) experiential learning theory, which posits that learning is most effective when students actively engage in problem-solving and reflection based on their experiences.

Another important aspect of CTL and VR integration is its potential to bridge learning gaps among students with different learning styles. Some students may struggle with abstract concepts when taught through traditional lectures, but VR's immersive nature helps make complex ideas more tangible. Additionally, collaborative CTL activities provide opportunities for peer learning, where students can share perspectives and build collective knowledge. Research by Johnson-Glenberg et al. (2014) supports this notion, showing that VR-enhanced learning environments lead to higher cognitive gains and greater student participation compared to conventional methods.

CONCLUSION

The integration of the Contextual Teaching and Learning (CTL) model with Virtual Reality (VR) technology in Pancasila Education has demonstrated a significant positive impact on student learning outcomes. By providing a more immersive, interactive, and relevant learning experience, students can gain a deeper and more contextual understanding of Pancasila values. VR technology enables students to engage in real-life simulations, making abstract concepts more tangible and relatable. Meanwhile, the CTL approach encourages students to connect these values with their daily experiences, fostering meaningful learning. This combination not only enhances cognitive comprehension but also cultivates essential skills such as critical thinking, problem-solving, and empathy. By experiencing various social scenarios, students can develop a stronger awareness of the practical application of Pancasila principles in real-world situations. Furthermore, the interactive nature of VR promotes student engagement, motivation, and active participation in the learning process.

Integrating CTL and VR in Pancasila Education plays a crucial role in character development. It allows students to internalize moral and ethical values through experiential learning, reinforcing their commitment to applying these principles in social and civic life. As a result, students become more prepared to face contemporary challenges while upholding national identity and values. Overall, this approach represents a transformative and innovative strategy in education. By combining technology with pedagogical principles, it enhances not only knowledge acquisition but also character formation, making learning more meaningful and impactful. The integration of CTL and VR in Pancasila Education is a significant step forward in improving the quality of education, fostering a generation of students who are intellectually competent, socially responsible, and ethically grounded.

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