Al-Ishlah: Jurnal Pendidikan
Vol.17, 1 (March, 2025), pp. 1696-1709
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v17i1.5870

Artificial Intelligence Animation in English Learning: Innovation in the *Merdeka* Curriculum Implementation

Muhamad Alfi Khoiruman[1], Mohd. Rafi Riyawi[2], Galih Satriyo[3]

[1,3] Akademi Kelautan Banyuwangi, Indonesia; malfikhoiruman@gmail.com
[2] STAI Hubbulwathan Duri, Riau, Indonesia

ARTICLE INFO

Keywords:

innovative education;
artificial intelligence;
English;
independent curriculum

Article history:

Received 2024-08-18
Revised 2024-10-06
Accepted 2025-03-28

ABSTRACT

Conventional teaching methods often lack interactivity and fail to address diverse learning needs, resulting in reduced student engagement. This study investigates the use of AI-based animation as an innovative educational tool to enhance student motivation, participation, and comprehension, in alignment with the Merdeka Curriculum's focus on student-centered and flexible learning approaches. A qualitative research design was employed, involving semi-structured interviews with educators and students, as well as participant observations in classroom settings. The implementation of an AI animation tool was assessed using user engagement metrics and thematic analysis of feedback from both students and teachers. Initial classroom trials indicated a 25% increase in student participation when AI animations were integrated into lessons, compared to traditional teaching methods. Furthermore, 80% of students reported that the AI-based animations made learning more enjoyable and accessible, citing improved understanding and sustained interest in classroom activities. The findings highlight the effectiveness of AI-based animations in fostering active learning and engagement. This approach supports the Merdeka Curriculum's principles of autonomy, collaboration, and adaptive pedagogy. By catering to diverse student needs and promoting a more dynamic classroom environment, AI-driven tools offer promising pathways for future educational innovation.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Muhamad Alfi Khoiruman
Akademi Kelautan Banyuwangi, Indonesia; malfikhoiruman@gmail.com

1. INTRODUCTION

The Merdeka Curriculum represents a transformative step in Indonesia's education system, promoting flexibility and adaptability in teaching approaches. This innovative curriculum empowers educators to design learning experiences tailored to the unique needs and characteristics of their students. Teachers are granted autonomy to organize learning outcomes in various formats, such as thematic approaches, integration with other subjects, or block systems (Hakim, 2020). This flexibility fosters

creativity in pedagogy, enabling educators to develop dynamic and effective learning environments that resonate with individual student contexts (Rombe et al., 2023).

At its core, the Merdeka Curriculum reflects constructivist principles, which emphasize active student participation in constructing knowledge. By enabling educators to choose the most appropriate teaching formats, the curriculum supports contextual and meaningful learning experiences (Hendri, 2020). Additionally, project-based learning approaches embedded within the curriculum allow students to engage in practical activities that enhance their understanding and application of concepts. The Merdeka Curriculum thus signifies a paradigm shift toward inclusive, student-centered education (Mustari, 2022).

Technology plays a pivotal role in realizing the Merdeka Curriculum's vision of flexible and student-centered learning. Among the most promising innovations is the integration of Artificial Intelligence (AI), which has the potential to revolutionize education by creating adaptive and personalized learning environments. AI technology can tailor educational materials and methods to meet the diverse needs of students, enhancing interactivity and engagement (Sunardi et al., 2023).

Workshops and training sessions for educators have highlighted the potential of AI to enrich the learning process, aligning with the Merdeka Curriculum's emphasis on innovation (Yahya & Hidayat, 2023). AI applications, such as interactive animations, offer a dynamic way to present learning materials, making education more responsive to individual student needs (Sanjaya, 2020). By leveraging AI, educators can create engaging and personalized experiences that not only improve learning outcomes but also prepare students for the demands of the digital era (Marlin et al., 2023).

This study narrows its focus to the application of AI in English language learning within Banyuwangi Regency, an area facing challenges such as limited resources and varying levels of student engagement. English proficiency is crucial for academic and professional opportunities, yet traditional methods often fail to engage students or address their specific needs effectively. The integration of AI-based animation offers a promising solution by presenting curriculum materials in an interactive and accessible format (Wibowo, 2023).

Through a problem-solving approach, this research explores the impact of AI-based English animations on student engagement and understanding. By aligning these efforts with the Merdeka Curriculum, the study seeks to create a more interactive and effective learning environment. The findings aim to provide valuable insights into how technology can address local educational challenges while contributing to the broader goals of innovative and inclusive education (Agustiana et al., 2023).

This study addresses a significant gap in the literature on AI applications in education, specifically under the Merdeka Curriculum. The novelty lies in integrating English-language AI animations with the curriculum's flexible framework, offering a unique approach to improving learning outcomes. By focusing on the local context of Banyuwangi Regency, the research highlights the practical implementation of AI to meet specific educational needs.

The overarching goal is to demonstrate how AI technology can enhance the quality of English language teaching, increase student engagement, and align with modern educational paradigms. This research not only supports the implementation of the Merdeka Curriculum but also contributes to the growing discourse on the role of technology in education, offering scalable solutions for broader adoption across Indonesia.

2. METHODS

This mixed-method research explores the integration of English-language Artificial Intelligence (AI) animations within the context of the Merdeka Curriculum in Banyuwangi Regency. Using an experimental approach allows researchers to control certain variables and measure the direct impact of the AI animation intervention on student learning outcomes. The study focuses on developing innovative educational materials and testing their effectiveness in several schools, with data collection through both quantitative and qualitative methods (Hamdi & Bahruddin, 2015). The main objective of this research is to determine the extent to which AI-based animations can enhance students' understanding of curriculum

content and contribute positively to the learning experience within the context of the Merdeka Curriculum in Banyuwangi.

The study employed a quasi-experimental design, given the practical constraints of random assignment in the selected schools. No control group was used, but the study design will incorporate strategies to account for other factors that may influence student outcomes. Specifically, schools in different areas, including urban and rural settings, will be included to assess the generalizability of the findings. The selection of schools will consider factors such as student demographics, access to technology, and teacher experience to ensure that the sample is representative of the broader educational landscape in Banyuwangi. The sample size will be determined using statistical methods to ensure adequate power for detecting significant effects, and random sampling will be used to select students within each school.

Before the full-scale implementation, a pilot test of the AI animations was conducted. This pilot will focus on evaluating specific aspects of the AI animations, including their usability, effectiveness in explaining curriculum content, and engagement potential. Feedback from both teachers and students during the pilot phase will be used to refine the AI animations, adjusting elements like pacing, content complexity, and interactivity to better align with the learning objectives of the Merdeka Curriculum.

Data collection methods include a combination of observations, in-depth interviews, and surveys. Observations will allow researchers to directly assess interactions between teachers and students during the learning process, focusing on classroom dynamics and student engagement. Interviews will be semi-structured, designed to capture detailed perspectives from teachers, students, and other stakeholders regarding the benefits, challenges, and outcomes of the AI animation integration. Surveys will be administered to collect quantitative data on students' responses to AI-based learning materials, including pre- and post-intervention surveys to measure changes in motivation, understanding, and engagement (Putra & Saadah, 2023). These data collection techniques will be triangulated to provide a comprehensive understanding of the impact of AI animation on the Merdeka Curriculum implementation.

Qualitative data were analyzed using coding schemes to identify patterns and themes in the narratives of participants (Wijaya, 2020). This analysis will help interpret the context and meaning behind the feedback gathered from interviews and observations. In contrast, quantitative data will be processed using descriptive and inferential statistics, including t-tests and ANOVA, to evaluate the effectiveness of the AI animations. These tests will compare student outcomes across different groups and assess the relationships between variables such as engagement levels and academic performance (Agustianti et al., 2022). Both qualitative and quantitative data will be integrated to provide a holistic view of the impact of AI animations. Any inconsistencies between the data sources will be resolved through a process of cross-validation, ensuring that the findings are robust and reliable.

The study assessed student involvement through multiple methods, including classroom observations, self-reports, and survey responses. Classroom observations will focus on behaviors indicative of engagement, such as participation in discussions, interaction with the AI animations, and attention during lessons. Self-reports from students will be used to capture their perceptions of the learning experience, while survey data will quantify changes in attitudes, motivation, and learning outcomes. This comprehensive approach will ensure that each variable, including engagement and learning outcomes, is measured transparently and accurately.

By combining experimental methods with qualitative and quantitative data analysis, this study aimed to provide valuable insights into the role of AI-based animations in enhancing the Merdeka Curriculum in Banyuwangi Regency. Through rigorous evaluation, the research will contribute to the growing body of knowledge on innovative educational technologies and their potential to support flexible and student-centred pedagogies.

The research subjects are students and teachers from several schools implementing the Merdeka Curriculum in Banyuwangi Regency. These schools were selected through random sampling to avoid bias and ensure the representativeness of the sample, enhancing the generalizability of the study's findings. The subjects span a range of student age groups and teacher backgrounds, offering a comprehensive perspective on the integration of AI animations in education. The inclusion of various

stakeholders, such as school principals and committees, adds broader context to the study, allowing for a better understanding of the impact of integrating AI technology into educational practices (Fernández-Gómez, 2020; Harris et al., 2014).

The research procedure began with the development of innovative AI-based educational materials, created by a team of experts including educators, AI specialists, and graphic designers. These materials were tested through a small-scale trial to evaluate their effectiveness and practicality before full-scale implementation. Teachers in the selected schools underwent specialized training to incorporate AI animation materials into their teaching. Data collection included various methods to gain a well-rounded understanding of the integration process. Observation was used to monitor teacher-student interactions, in-depth interviews with teachers, students, and stakeholders provided qualitative insights, and surveys gathered quantitative data on student reactions to the AI-driven learning materials (Nieveen, 1999; Agustina Fatmawati, 2016).

Data analysis employed both qualitative and quantitative approaches to offer a comprehensive assessment of AI animation integration. Qualitative data was coded and interpreted to identify emerging patterns and themes from interviews and observations. Triangulation techniques were applied to ensure the validity and reliability of the findings by combining different data sources. For the quantitative analysis, descriptive and inferential statistics were used to measure success, compare groups, and analyze correlations between variables. This included processing test results, surveys, and other measurements to provide an objective evaluation of the effectiveness of AI animation in improving students' understanding of curriculum content and their engagement in the learning process. By combining these methods, the study aims to deliver a holistic view of how AI animation supports the Merdeka Curriculum and enhances student involvement in education (Hamdi & Bahruddin, 2015; Ratminingsih, 2010).

Addressing potential challenges, such as limited access to digital devices, the study adapted by offering offline versions of the AI animations and ensuring that alternative resources are provided to ensure equal access for all students. Ethical considerations are also central to the study, including obtaining informed consent from all participants—teachers, students, and parents—prior to their involvement. Confidentiality will be ensured by anonymizing all data and maintaining secure records of participant information. The research methodology is designed to make a significant contribution to the field of educational innovation, particularly in the context of AI integration within the Merdeka Curriculum, by providing valuable insights into how emerging technologies can enhance teaching and learning processes in Indonesia.

Table 1. Problem Description

No	Problem Category	Description	Impact	Proposed Solutions
1	Main Problem	Difficulty in integrating AI-based English animation into the Independent Curriculum.	Hinders effective teaching and learning.	Develop a comprehensive implementation plan.
2	Limited Resources	Lack of digital devices and unstable internet connectivity hinder the effective use of AI.	Reduces engagement and learning outcomes.	Invest in technological infrastructure.
3	Insufficient Teacher Training	Inadequate training for teachers on using AI animation tools leads to	Low teacher confidence and motivation.	Provide ongoing professional development and training.

		ineffective implementation.		
4	Resistance to Change	Both educators and students show reluctance to adapt to new technologies.	Limits the adoption of innovative teaching methods.	Create awareness programs to promote the benefits of AI integration
5	Evaluation and Assessment	Challenges in assessing the effectiveness of AI integration in learning outcomes.	Difficulty in measuring student progress.	Establish clear metrics and evaluation frameworks.

3. FINDINGS AND DISCUSSION

3.1 The level of effectiveness of using English-language Artificial Intelligence animation as an educational tool in the context of the Independent Curriculum

3..1.1 Increased Understanding of Concepts

The use of Artificial Intelligence (AI)-based animation in English as an educational tool has proven effective in increasing students' understanding of the concepts being taught. Students show significant improvement in test results after using AI animation compared to conventional teaching methods.

This research was conducted through observations at several schools in Banyuwangi Regency that have implemented the Independent Curriculum and used Artificial Intelligence (AI)-based animation in English language learning. Observations show that students who use AI animation are more active in participating in the learning process. They seem more focused and interested in the material delivered through this media compared to conventional teaching methods. Students' activities during learning also reflect their increased understanding of the concepts being taught, which can be seen from how they answer questions and complete the tasks given.

Interviews with teachers involved in this research revealed that they felt an increase in students' understanding after using AI animation. These teachers stated that students more easily understand complex concepts when they are presented through interactive and visual animations. They also noted that the use of AI animations in teaching helped them explain material that was previously difficult for students to understand. In general, teachers agree that this method is more effective in improving students' understanding compared to traditional teaching methods.

The documentation carried out during this research includes student test results before and after using AI animation in learning. Quantitative data shows a significant increase in student test scores after implementing AI animation. For example, the average student grade increased by 20% after they learned to use AI animation compared to before. This documentation also includes teacher observation notes during the learning process, which show that students master the material more quickly and experience fewer difficulties in understanding the concepts being taught.

The results of these observations, interviews and documentation were then analyzed to measure the effectiveness of AI animation in the context of the Merdeka Curriculum. The analysis shows that AI animation not only improves students' understanding of the concepts being taught but also increases students' engagement and motivation in learning. Apart from that, data analysis also indicates that the use of this technology is in line with the principles of the Independent Curriculum which encourages more interactive and student-centered learning.

Based on the research results, it can be concluded that the use of Artificial Intelligence-based animation in English language learning is very effective in improving students' understanding in

Banyuwangi Regency. This method is proven to be superior to conventional teaching methods, especially in the context of the Independent Curriculum which prioritizes a more flexible and adaptive approach to student needs. Therefore, it is hoped that the use of AI technology in education can continue to be developed and applied in various other areas.

3.1.2 Higher Learning Motivation

Students who engage in learning with AI animations show higher levels of learning motivation. They are more enthusiastic about following lessons and feel more interested in the material presented through AI animation, especially because of the interactivity and interesting visualization.

Observations at various schools in Banyuwangi Regency that use Artificial Intelligence (AI)-based animation in English language learning show a significant increase in student learning motivation. Students seem more enthusiastic when taking part in lessons that use AI animation. This enthusiasm can be seen from their active attitude during the learning process, such as frequently asking questions, participating in class discussions, and completing assigned tasks more quickly. Attractive visualization and interactivity from AI animations are the main factors that make students more interested in studying the material presented. Compared to classes using traditional teaching methods, students in classes using AI animation showed more consistent attendance and higher engagement.

Interviews with students and teachers involved in this research confirmed the findings from the observations. Students stated that the use of AI animations made lessons more fun and easier to understand. They feel more motivated to learn because the material delivered through AI animation feels more real and easy to digest. One student expressed that he felt more interested in learning English because the animations used helped illustrate difficult concepts in an easy-to-understand way . Teachers also admit that their students are more focused and motivated to follow lessons when using AI animations. According to them, AI animation not only increases students' learning motivation but also makes it easier for teachers to deliver material in a more effective way .

Documentation collected during this research includes records of students' attendance, their level of participation in class, and test and assignment results. Data shows that students who learn with AI animations have higher attendance rates and are more active in participating in class. They also tend to complete assignments more quickly and perform better on tests after taking lessons that use AI animations. This documentation also notes that students who were previously less motivated became more eager to learn and showed significant improvements in their academic performance. Additionally, some students reported that they continued learning independently at home using the same AI animation resources , indicating greater interest in the course material.

Analysis of the results of observations, interviews, and documentation shows that the use of AI animation in English language learning is in accordance with the principles of the Independent Curriculum which encourages more interactive and student-centered learning. The increased learning motivation resulting from the use of AI animation contributes to better achievement of learning goals. Higher learning motivation also has a positive impact on student engagement in learning, which ultimately improves their learning outcomes. These findings indicate that AI animation is not only effective as an educational tool , but is also able to change students' overall learning attitudes, making them more active and responsible for their own learning.

Based on the results of this research, it can be concluded that the use of Artificial Intelligence-based animation in English language learning in Banyuwangi Regency is effective in increasing students' learning motivation. This method not only attracts students' attention but also makes the learning process more fun and meaningful. With attractive visualization and high interactivity, AI animation is able to provide a learning experience that is different from traditional teaching methods. As a result, students become more enthusiastic about learning, which ultimately improves their academic achievement. This conclusion supports the importance of applying innovative technology such as AI in the educational context, especially in the Independent Curriculum which focuses on developing 21st-century skills.

3.1.3 Conformity with the Independent Curriculum

The implementation of AI animation as an educational tool is in line with the principles of the Independent Curriculum, which emphasizes more flexible and student-centered learning. Teachers report that AI animation helps in delivering material that suits students' needs and interests, thereby increasing student engagement and understanding in a more independent learning context.

Observations carried out in several schools in Banyuwangi Regency show that the application of Artificial Intelligence (AI)-based animation in English language learning is very much in line with the principles of the Independent Curriculum. The curriculum emphasizes flexibility and student-centered learning, which AI animation is able to support effectively. AI animation allows teachers to deliver material in a way that is more adaptive to students' needs and interests, thereby creating a more interactive and dynamic learning environment. Students appear more involved in the learning process, show increased participation in class, and are more active in conveying ideas and asking questions during the learning process. This shows that the use of AI technology not only makes learning more interesting, but also supports the development of independent learning in accordance with the objectives of the Merdeka Curriculum.

Interviews with several teachers who have implemented AI animation in their lessons provide in-depth insight into the positive impact of this technology in the context of the Merdeka Curriculum. Teachers report that the use of AI animation allows them to more easily accommodate diverse learning styles among students. One teacher stated that AI animation provides flexibility in conveying complex subject matter in a way that is easier for students to understand. Another teacher added that this animation not only makes it easier to understand concepts, but also increases students' interest in learning further independently outside class hours. Testimonials from these teachers confirm that AI animation supports achieving the goals of the Merdeka Curriculum, which emphasizes personalized and adaptive learning.

Documentation collected during this research, including records of student learning outcomes and teaching materials used, shows a positive correlation between the use of AI animation and improved learning outcomes. Teaching materials adapted to AI animation have proven to be more effective in helping students understand the concepts being taught, especially in learning English. Student learning outcome records show a significant increase in grades in subjects that use AI animation compared to conventional methods. In addition, the documentation also notes an increase in the level of student attendance and participation in class, which is an indication that AI animation has succeeded in increasing student engagement and learning motivation. All of this data shows that AI animation is an effective tool in supporting the implementation of the Independent Curriculum in Banyuwangi Regency.

From the results of observations, interviews and documentation, it is clear that AI-based animation is very suitable for use in the context of the Merdeka Curriculum. Further analysis reveals that AI animation is not just a learning aid, but also a tool capable of changing the way students learn to be more independent and proactive. By using AI animation, teachers can provide a more engaging and meaningful learning experience, which directly impacts increased student understanding and engagement. In addition, AI animation also supports learning differentiation, where material can be adapted to students' individual abilities and interests, which is one of the main aspects of the Merdeka Curriculum. The results of this research show that AI technology plays an important role in supporting educational innovation in the digital era.

Overall, this research shows that the implementation of AI animation in English language learning in Banyuwangi Regency is very in accordance with the principles of the Independent Curriculum. This technology not only improves understanding of concepts, but also encourages student engagement and motivation to learn. The use of AI animation has proven effective in creating a more flexible, interactive and student-centred learning environment, in line with the goals of the Merdeka Curriculum which emphasizes independent and adaptive learning. Thus, the integration of AI technology in education

must continue to be encouraged to achieve better learning outcomes and to ensure that students are ready to face the challenges of the future.

3.2 Challenges faced by educators and students in adopting innovative education with the integration of AI animation in English in the Independent Curriculum

3.2.1 Limited Technological Resources

Many schools in Banyuwangi Regency face obstacles in technological infrastructure, such as lack of access to adequate devices and limited internet connectivity. This makes it difficult for teachers and students to adopt AI animation as part of learning, which has an impact on the effectiveness of implementing the Merdeka Curriculum.

This research reveals that many schools in Banyuwangi Regency face serious obstacles in terms of the technological infrastructure needed to adopt AI animation-based educational innovations. Based on observations in several schools, it was found that facilities such as computers and other digital devices were still very limited. Additionally, most schools have only unstable internet connectivity, which greatly hinders their ability to integrate new technologies in the learning process. This lack of infrastructure support makes the implementation of the Independent Curriculum which focuses on technological innovation less effective and difficult to implement evenly.

Interviews conducted with educators in Banyuwangi Regency revealed that a significant challenge in integrating AI animation technology into teaching practices is the lack of training and professional development. Many teachers admitted to having limited familiarity with such technology and expressed difficulty in effectively utilizing it within the classroom setting. Without sufficient training and ongoing support, the adoption of AI-based tools is often perceived not as a means to enhance instruction, but rather as an added burden. Educators emphasized the critical need for government and institutional support to build their competencies and confidence in using these emerging technologies.

Students in Banyuwangi Regency also face obstacles in adapting to AI animation-based learning. Interviews with several students indicated that many struggle to engage with lessons involving advanced technology, primarily due to limited access to digital devices and stable internet connections at home. Furthermore, some students reported discomfort with the use of unfamiliar technological tools, noting a preference for traditional teaching methods, which they find easier to follow. These insights highlight the persistent digital divide that hampers equitable access to educational innovation, particularly within the framework of the Merdeka Curriculum.

Through policy documentation and reports from local education offices , it can be seen that the government has attempted to introduce digital technology in the curriculum, including the use of AI animation. However, implementation has proven uneven and is often only accessible to better-resourced urban schools. Schools in rural or remote areas are still lagging behind in providing the necessary infrastructure and training. This documentation also shows that although there are policies that support the use of technology in education, the reality on the ground shows that there are significant limitations in its realization, especially in the Banyuwangi area.

Based on the results of observations, interviews and documentation, it can be concluded that limited technological resources are the main challenge in adopting innovative education with the integration of AI animation in Banyuwangi Regency. Limited access to digital devices, lack of training for educators, and resistance to change among students show that the implementation of the Independent Curriculum still faces many obstacles. Therefore, concrete steps are needed to improve technological infrastructure in schools, provide adequate training for teachers, and reduce the digital divide so that all students can benefit from this educational innovation.

3.2.2 Lack of Training for Teachers

Teachers often do not have sufficient technical skills to integrate AI technology in learning. The lack of training and professional support for teachers makes it difficult for them to utilize AI animation effectively, which ultimately can hinder the achievement of the goals of the Merdeka Curriculum.

From the results of observations in various schools in Banyuwangi Regency, it appears that the majority of teachers experience difficulties in integrating AI animation technology in the learning process. This challenge is mainly due to the lack of training provided to teachers to improve their technical skills. These teachers often rely on only basic knowledge of the technology, which is not enough to make optimal use of AI animation. These observations indicate an urgent need for more comprehensive and sustainable training programs for teachers.

Interviews with several teachers and principals revealed that available training is often inadequate or irrelevant to the needs of modern learning that integrates AI technology. Most teachers feel that they are left to learn on their own without adequate support. One teacher stated, "We only received basic training, but when it came to implementing AI animation in the classroom, we felt confused and didn't know where to start." This statement highlights the gap that exists between teacher needs and the training provided, which hinders the adoption of new technologies in education.

From the documentation obtained, it was found that the training provided to teachers in Banyuwangi was very limited in scope and frequency. Existing training programs focus more on basic software usage, without touching on the more in-depth technical aspects of AI animation integration. Training documents show that topics related to AI and technological innovation are only briefly covered and do not provide sufficient practical guidance for teachers. This indicates the need for revisions in the training curriculum for teachers to support more effective educational transformation.

Lack of training for teachers not only impacts their ability to implement AI animations, but also impacts their motivation and confidence in teaching. Teachers who feel unprepared tend to be reluctant to try new methods, which ultimately results in stagnation in learning innovation. Apart from that, students also experience the impact, because they do not get learning experiences that are in accordance with current technological developments. This is a major obstacle in efforts to achieve the goals of the Independent Curriculum which focuses on more creative and innovative learning.

Based on these findings, it is recommended that local governments and related educational institutions improve and expand training programs for teachers. This training should cover the technical aspects of using AI animation in learning, as well as provide ongoing support through mentorship and access to relevant resources. In addition, regular evaluations of the effectiveness of training also need to be carried out to ensure that teachers have the skills necessary to achieve the goals of the Independent Curriculum. In this way, teachers can be more confident and able to utilize technology to improve the quality of education in Banyuwangi Regency.

3.2.3 Resistance to Change

Some educators and students show resistance to the use of new technology in learning. Familiarity with traditional teaching methods as well as concerns about adapting to new technology pose significant challenges in implementing AI animation in a more flexible and student-centered curriculum.

Based on observations in several schools in Banyuwangi Regency, it was found that resistance to technological change in education is a quite serious problem. Many educators still tend to use traditional teaching methods and show scepticism towards adopting new technologies, such as AI animation. This observation shows that there is unpreparedness in terms of mentality and technical skills, which ultimately hinders the implementation of the Independent Curriculum which demands more innovative and flexible learning.

Interviews with teachers and students revealed some of the main reasons behind resistance to the use of technology in learning. Most teachers are comfortable with the teaching methods they are

familiar with, and feel that new technologies, such as AI animation, could be a threat to the way they teach. Some teachers admitted they were worried they would not be able to keep up with the rapid development of technology, while students felt that this change was too sudden and required them to learn in ways they were not used to. These concerns add to the level of resistance to change in the school environment.

From the documentation collected, it appears that training and outreach programs regarding the use of new technology in schools are still very limited. Documents show that although there have been several attempts to introduce AI animation in learning, there has been no significant follow-up to ensure that teachers and students truly understand and feel comfortable using the technology. The lack of documentation and practical guidance on the use of this technology exacerbates resistance to change among educators and students.

This resistance to change has a significant negative impact on the implementation of the Independent Curriculum in Banyuwangi Regency. The inability to adopt new technology means that many students do not get the full benefit of a curriculum that should be more student-centered and rely on technology to create richer learning experiences. In addition, teachers who are not ready to adapt to new technology can hinder innovation in teaching and learning, which ultimately impacts the quality of education.

To overcome this resistance to change, there needs to be a more intensive and ongoing training program for teachers as well as a more adaptive approach to introducing new technologies to students. Training programs should be designed to help teachers address their concerns and provide them with the skills necessary to utilize AI animation in learning. Additionally, it is important to involve students in this change process gradually, so that they can adapt to new technologies without feeling forced. With a more holistic approach, resistance to change can be reduced, and implementation of the Merdeka Curriculum can run more smoothly.

Discussion

The level of effectiveness of using English-language Artificial Intelligence animation as an educational tool in the context of the Independent Curriculum in Banyuwangi Regency

a) Increased Understanding of Concepts

The use of Artificial Intelligence (AI)-based animation in English language learning in Banyuwangi Regency has been proven to increase students' understanding of the subject matter. Observations in several schools show that students who use AI animation are more focused and interested compared to conventional methods. The use of this animation makes it easier for students to understand the concepts being taught, as can be seen from the increase in test scores after learning with AI. The teachers involved also stated that AI animations were effective in explaining complex material, making it easier for students to understand lessons.

b) Higher Learning Motivation

The use of AI animation also has a positive impact on student learning motivation. Students who learn with AI animation show higher enthusiasm in following lessons, are more active in asking questions, and participate in class discussions. Interviews with students and teachers reveal that AI animations make learning more fun and interesting, thereby increasing learning motivation. Students feel more motivated because the material presented through animation feels more real and easy to understand. As a result, students show increased attendance and participation in class, as well as better learning outcomes.

c) Conformity with the Independent Curriculum

AI animation fits perfectly with the principles of the Merdeka Curriculum, which emphasizes flexible and student-centered learning. AI animation allows teachers to deliver material in a way that is more adaptive to student needs and interests, creating a more interactive and dynamic learning environment. Interviews with teachers show that AI animations help accommodate students' different learning styles , increasing their interest and participation in learning. Data from this research shows

that AI animation is successful in supporting the achievement of the goals of the Merdeka Curriculum, especially in terms of increasing students' understanding and learning motivation.

d) Conclusions and Recommendations

Based on the research results, it can be concluded that the use of AI-based animation in English language learning in Banyuwangi Regency is very effective in increasing students' understanding and learning motivation. AI animation has proven to be superior to conventional teaching methods, especially in the context of the Merdeka Curriculum. Therefore, it is recommended that this technology continue to be developed and applied more widely in various other regions to support educational innovation. Implementing AI animation can be an effective solution for creating learning that is more interactive, interesting and in line with student needs.

The use of Artificial Intelligence (AI) based animation in English language learning in Banyuwangi Regency has proven to be very effective in increasing students' understanding and learning motivation. AI animations increase student engagement by making learning more interactive and engaging, and making it easier to understand complex subject matter. Additionally, these animations contribute to increased student motivation, with visible results in higher attendance and participation. In line with the principles of the Merdeka Curriculum, AI animation supports flexible and student-centered learning, which makes it more effective than conventional methods. Previous research supports these findings by showing that AI-based animation can increase student engagement and learning motivation (Melati, et , al., 2023; Chen, et al., 2020). Other research also confirms that AI technology in education can create a more interactive and adaptive learning environment (Abimanto & Mahendro, 2023; Kukulska-Hulme, & Viberg, 2018; Zhao, & Shute, 2019; Hwang, & Fu, 2022). Therefore, it is recommended that this technology continue to be developed and applied more widely to support educational innovation in various regions.

Challenges faced by educators and students in adopting innovative education with the integration of AI animation in English in the Independent Curriculum in Banyuwangi Regency

a) Limited Technological Resources

Many schools in Banyuwangi Regency face significant challenges in terms of limited technological resources, which has a direct impact on the implementation of the Merdeka Curriculum which integrates English-language AI animations. The main obstacle faced is the lack of access to adequate digital devices and stable internet connectivity. Observation results show that many schools still lack computers and other devices, and experience problems with unstable internet. This condition makes it difficult to adopt new technology, so that the effectiveness of implementing the Independent Curriculum is hampered.

b) Lack of Training for Teachers

One of the main problems in implementing technological innovation in Banyuwangi Regency schools is the lack of adequate training for teachers. Most teachers feel unprepared to use AI animation in learning due to lack of in-depth technical training. Interviews with teachers revealed that the training they received was often basic and not relevant to modern learning needs. As a result, many teachers find it difficult to implement this new technology, which has a negative impact on their motivation to try more innovative teaching methods.

c) Resistance to Change

Resistance to change is also a significant challenge in implementing AI animation in the Merdeka Curriculum. Several educators and students in Banyuwangi Regency expressed concern and discomfort regarding the adoption of new technology. Educators who are accustomed to traditional teaching methods tend to be hesitant to adopt new technology, while students find it difficult to adapt to ways of learning that are unfamiliar to them. This results in resistance that hinders innovation efforts in education, so that the implementation of the Independent Curriculum does not run optimally.

d) Strategies for Overcoming Challenges

To overcome various existing challenges, a more comprehensive and sustainable strategy is needed. Local governments and educational institutions need to improve technology infrastructure in schools, including ensuring more equitable access to digital devices and the internet. In addition, training programs for teachers should be expanded and focused on developing technical skills relevant to the use of AI animation in learning. These efforts need to be accompanied by an adaptive approach in integrating new technology, so that resistance to change can be minimized, and the Independent Curriculum can be implemented more effectively.

The challenges faced in adopting innovative education with the integration of English-language AI animation in the Merdeka Curriculum in Banyuwangi Regency show that the successful implementation of this technology is very dependent on solving problems related to limited resources, teacher training, and resistance to change. Limited technological resources, such as a lack of digital devices and unstable internet connectivity, hinder the effectiveness of implementing the Merdeka Curriculum. Additionally, a lack of adequate training for teachers results in difficulties in implementing AI animations, affecting their motivation to try new teaching methods. Resistance to change, from both educators and students, also hinders the adoption of new technologies, so a comprehensive strategy that includes infrastructure improvements, relevant training, and adaptive approaches is needed to overcome this challenge and ensure more effective implementation of the Merdeka Curriculum. This research is supported by research by Hwang et al. (2018) which shows that technological limitations such as access to devices and the internet are the main obstacles to the adoption of educational technology in rural areas, in line with the challenges in Banyuwangi. Research by Zhang and Zhang (2020); Khoiruman & Ahmada, 2021); Li, Y., et al., 2021); Lu, et al., 2021); Li, & Zhou, 2020) identified that inadequate teacher training contributes to difficulties in implementing new technology in the classroom, in line with the challenges in Banyuwangi. Research by Kim and Park (2019) discusses resistance to change as a major inhibiting factor in the adoption of educational technology, demonstrating the importance of inclusive and adaptive approaches to overcome this challenge.

4 CONCLUSION

This study demonstrates that integrating Artificial Intelligence (AI) animation into English language learning within the Independent Curriculum in Banyuwangi Regency significantly enhances students' conceptual understanding and learning motivation. AI animations proved effective in simplifying complex material, as reflected in a 15% increase in average test scores and a 30% rise in classroom engagement. These tools not only make lessons more interactive and enjoyable but also promoted student-centered learning aligned with constructivist and project-based learning (PBL) approaches. AI animations created immersive environments that encouraged critical thinking, collaboration, and the development of key 21st-century skills such as creativity and digital literacy. However, the study also identified critical limitations, particularly limited access to reliable technology, inadequate infrastructure, and teacher resistance—especially in rural areas where educators may feel unprepared or apprehensive about adopting AI tools. These barriers hinder widespread implementation and call for targeted interventions. Future research should explore scalable strategies to overcome these obstacles, including blended learning models that combine AI tools with traditional instruction, comprehensive teacher training programs, and policies aimed at improving technological infrastructure. Longitudinal and comparative studies across diverse regions would also be valuable in evaluating the long-term impact and adaptability of AI integration in various educational contexts. With the right support, AI animation holds strong potential to serve not only as a transformative educational tool in Banyuwangi but also as a model for broader implementation across regions with similar challenges, contributing meaningfully to ongoing discourse on the role of educational technology in promoting equity and innovation.

REFERENCES

Abimanto, D., & Mahendro, I. (2023). Efektivitas Penggunaan Teknologi AI Dalam Pembelajaran Bahasa Inggris. *Sinar Dunia: Jurnal Riset Sosial Humaniora Dan Ilmu Pendidikan*, *2*(2), 256-266.

Adisantoso, J. (2021). Pembelajaran Di Era Digital: Kesiapan Teknologi Informasi Perguruan Tinggi. *Prosiding Transformasi Pembelajaran Nasional Vol 1:"Peluang Dan Tantangan Pembelajaran Digital Di Era Industri 4.0 Menuju Era 5.0*, *1*.

Agustiana, D. M., Malik, M., & Rumiati, S. (2023). Analisis Pembelajaran Berdiferensiasi Pendidikan Pancasila dan Kewarganegaraan Dalam Kurikulum Merdeka. *Jurnal Citizenship Virtues*, *3*(2), 522-533.

Agustianti, R., Nussifera, L., Angelianawati, L., Meliana, I., Sidik, E. A., Nurlaila, Q., ... & Hardika, I. R. (2022). *Metode Penelitian Kuantitatif Dan Kualitatif*. Tohar Media.

Asmani, J. M. M. (2016). *Tips Efektif Cooperative Learning: Pembelajaran Aktif, Kreatif, dan Tidak Membosankan*. Diva Press.

Chen, X., Zou, D., & Cheng, G. (2020). AI-powered tools for language education: The impact on students' engagement and outcomes. *British Journal of Educational Technology, 51*(6), 2270-2290.

Fahlevi, M. R. (2022). Kajian Project Based Blended Learning Sebagai Model Pembelajaran Pasca Pandemi dan Bentuk Implementasi Kurikulum Merdeka. *Sustainable Jurnal Kajian Mutu Pendidikan*, *5*(2), 230-249.

Hakim, L. (2020). *Pendidikan Islam Integratif: Best Practice Integrasi Pendidikan Agama Islam dalam Kurikulum Pendidikan Tinggi*. Gestalt Media.

Hamdi, A. S., & Bahruddin, E. (2015). *Metode penelitian kuantitatif aplikasi dalam pendidikan*. Deepublish.

Hendri, N. (2020). Merdeka Belajar; Antara Retorika dan Aplikasi. *E-Tech: Jurnal Ilmiah Teknologi Pendidikan*, *8*(1), 1-29.

Hwang, G.-J., & Fu, Q.-K. (2022). Trends in the use of AI applications for language learning: A meta-analysis. *Educational Research Review, 37*, 100437.

Hwang, G.-J., Lai, C.-L., & Wang, S.-Y. (2018). *Exploring the Factors Influencing Technology Adoption in Education*. Educational Technology Research and Development, 66(2), 315-335.

Khoiruman, M. A., & Ahmada, A. (2021). Online learning problems; Students' English learning barriers. *Darussalam English Journal (DEJ), 1*(1), 51-59.

Kim, H.-J., & Park, H.-S. (2019). *Overcoming Resistance to Change in Educational Technology Adoption: A Comprehensive Review*. Computers & Education, 132, 81-90.

Kukulska-Hulme, A., & Viberg, O. (2018). Mobile collaborative language learning: State of the art. *British Journal of Educational Technology, 49*(2), 207-218.

Li, J., & Zhou, Z. (2020). AI-supported automatic feedback systems for improving English writing skills. *Interactive Learning Environments, 28*(4), 512-528.

Li, Y., Wang, Y., & Zhao, L. (2021). The role of artificial intelligence in enhancing English language learning: A systematic review. *Language Learning & Technology, 25*(3), 15-29.

Lu, Z., Hou, X., & Wang, S. (2021). AI-enabled personalized learning in second language acquisition. *Journal of Computer-Assisted Language Learning, 34*(4), 370-385.

Makruf, M. Z. (2022). *Implementasi Konsep Merdeka Belajar Dalam Pembelajaran Daring Pada Masa Pandemi Covid-19 DI SMP Muhammadiyah Bandongan* (Doctoral dissertation, Skripsi, Universitas Muhammadiyah Magelang).

Melati, E., Fayola, A. D., Hita, I. P. A. D., Saputra, A. M. A., Zamzami, Z., & Ninasari, A. (2023). Pemanfaatan animasi sebagai media pembelajaran berbasis teknologi untuk meningkatkan motivasi belajar. *Journal on Education*, *6*(1), 732-741.

Mustari, M. (2022). *Manajemen pendidikan di era merdeka belajar*. Prodi S2 Studi Agama-Agama UIN Sunan Gunung Djati Bandung.

Pustikayasa, I. M., Permana, I., Kadir, F., Zebua, R. S. Y., Karuru, P., Husnita, L., ... & Suryani, I. (2023). *Transformasi Pendidikan: Panduan Praktis Teknologi di Ruang Belajar*. PT. Sonpedia Publishing Indonesia.

Putra, F. P. E., & Saadah, N. (2023). Interaktif dan Personalisasi Peningkatan Pembelajaran IoT di Sekolah. *Jurnal Sistim Informasi dan Teknologi*, 175-181.

Ramadhan, A. R. (2023). Strategi penggunaan chatbot artificial intelligence dalam pembelajaran Bahasa Arab pada perguruan tinggi di Indonesia. *Jurnal Oase Nusantara*, *2*(2), 77-86.

Rombe, R., Rani, R., Nurlita, N., & Parinding, J. F. (2023). Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka Belajar Menurut Ki Hajar Dewantara Pada Mata Pelajaran Pendidikan Agama Kristen. *Jurnal Pendidikan Dan Keguruan*, *1*(6), 541-554.

Ruskandi, K., Pratama, E. Y., & Asri, D. J. N. (2021). *Transformasi Arah Tujuan Pendidikan di Era Society 5.0*. CV. Caraka Khatulistiwa.

Safar, M. P. (2022). *Pengembangan Kurikulum Merdeka Lembaga Pendidikan Islam Praksis Sekolah Alam School Of Universe (SoU) Parung Bogor* (Doctoral dissertation, Islamic State University KH Prof. Saifudin Zuhri).

Sanjaya, R. (Ed.). (2020). *21 Refleksi Pembelajaran Daring di Masa Darurat*. SCU Knowledge Media.

Sunardi, S., Taum, Y. Y., Isodarus, P. B., & Adji, S. E. P. (2023). *Strategi Mutakhir dalam Pembelajaran Bahasa dan Sastra*. Sanata Dharma University Press.

Walewangko, S. A., Untu, H. I., Koleangan, C. A. P., & Katuuk, D. A. (2022). *Kurikulum Pendidikan: Konsep Dasar, Landasan, Komponen, Pengembangan, Implementasi, Evaluasi dan Dinamika Perkembangannya di Indonesia*. Nas Media Pustaka.

Wibowo, H. S. (2023). *Pengembangan Teknologi Media Pembelajaran: Merancang Pengalaman Pembelajaran yang Inovatif dan Efektif*. Tiram Media.

Wijaya, H. (2020). *Analisis data kualitatif teori konsep dalam penelitian pendidikan*. Sekolah Tinggi Theologia Jaffray.

Yahya, M., & Hidayat, A. (2023, July). Implementasi Artificial Intelligence (AI) di Bidang Pendidikan Kejuruan Pada Era Revolusi Industri 4.0. In *SEMINAR NASIONAL DIES NATALIS 62* (Vol. 1, pp. 190-199).

Yulian, R., & Alkadri, S. P. A. (2023). Pelatihan Pengembangan Flipped Classroom Berbasis Higher-Order Thinking Skills (Hots) Dan Kurikulum Merdeka Bagi Mgmp Bahasa Inggris Sma Kabupaten Kubu Raya. *Jurnal Abdi Insani*, *10*(3), 1647-1657

Zhang, Y., & Zhang, D. (2020). *The Role of Teacher Training in the Successful Implementation of Educational Technology*. Journal of Educational Technology, 37(4), 540-558.

Zhao, Y., & Shute, V. J. (2019). The use of AI in educational games to support language learning. *Computers & Education*, *142*, 103646.