



MyPatriotic: Electronic Assessment Innovation Using the Naive Bayes Expertise Method to Measure Student Patriotic Attitudes

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Abstract. This study introduces MyPatriotic, an electronic assessment system leveraging the Naive Bayes algorithm to evaluate student patriotic attitudes. Conducted with 135 students from the PPKn department at Universitas Negeri Medan (2024 cohort), the research addresses the need for engaging and effective methods to assess patriotism, a crucial component of national character education. Utilizing a quantitative approach within the ADDIE framework, the system was systematically designed, developed, and evaluated to ensure its effectiveness. Findings reveal that 80% of participants found the electronic assessment more engaging and easier to understand compared to traditional paper-based methods, citing its interactive features and real-time feedback as key benefits. The immediate feedback mechanism enabled 70% of students to identify and address areas for improvement, fostering deeper reflection on patriotic values. Furthermore, 75% of students demonstrated significant improvement in their patriotic attitudes after using the system. The Naive Bayes algorithm achieved 92% accuracy in categorizing responses, highlighting its efficiency in processing large datasets and capturing nuanced attitudes toward patriotism. These results underscore the potential of MyPatriotic to enhance student engagement, understanding, and alignment with national ideals. By integrating digital technology, this initiative aligns with Sustainable Development Goal (SDG) 4 (Quality Education) and SDG 9 (Innovation and Infrastructure) while supporting Kampus Merdeka and Merdeka Belajar programs. MyPatriotic represents a step forward in modernizing assessment methods to foster national pride and commitment among students.

Keywords: Patriotism, Naive Bayes, Electronic Assessment, SDG 4, SDG 9, Kampus Merdeka, ADDIE, Education Technology.

1. Introduction

Patriotism is a critical pillar of national identity, essential to shaping the future leaders of a country. In Indonesia, however, the current methods for assessing patriotic attitudes in students are still primarily conventional and paper-based, often failing to engage students effectively. These methods do not fully capture the complexities of student attitudes or provide meaningful insights into their development (Susanto, 2022). The traditional pen-and-paper approach tends to be static, failing to adapt to the digital age where students are increasingly accustomed to interactive and tech-driven environments. Additionally, such assessments often lack real-time feedback, which is crucial in fostering continuous growth in students' attitudes toward patriotism.

This study introduces an innovative solution through *MyPatriotic*, an electronic assessment system using the Naive Bayes algorithm to measure student patriotic attitudes. The research, conducted at Universitas Negeri Medan with a sample of 135 students from the PPKn department (2024 cohort), was prompted by the observation that traditional evaluation techniques were insufficient. The preliminary observation revealed that only 45% of students showed a clear understanding of the values associated with patriotism,

while 50% exhibited a general sense of patriotism but lacked the depth to engage meaningfully with the nation's core values. 5% of the respondents displayed weak patriotism, with attitudes that could be influenced by a lack of proper assessment and engagement (Sumiatie, 2017). This data suggests a need for more dynamic and interactive tools to assess and foster patriotism (Wibowo, 2023).

The introduction of digital assessment systems, such as *MyPatriotic*, not only addresses the shortcomings of traditional paper-based systems but also aligns with the broader objectives of SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure) (Hidayat, 2023). In a rapidly changing educational landscape, there is an increasing demand for assessment tools that not only measure cognitive skills but also intangible qualities such as patriotism, responsibility, and national pride. The *MyPatriotic* system supports this shift by offering a more engaging and accurate method to assess and develop these attributes, thus encouraging students to reflect on their civic duties in a more interactive and impactful way. The project aims to contribute to the *Kampus Merdeka* and *Merdeka Belajar* initiatives by using technology to enhance student learning experiences, offer more engaging assessments, and promote national character development (Ahmad, 2021).

The objectives of this paper are:

1. To develop an electronic assessment system (*MyPatriotic*) that uses the Naive Bayes algorithm to measure student attitudes toward patriotism.
2. To assess the effectiveness of the system in providing an engaging and accurate measure of patriotism.
3. To support SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure) by fostering innovation in educational assessment practices.
4. To align with the *Kampus Merdeka* and *Merdeka Belajar* missions by integrating digital technologies in education and assessment processes.

By achieving these objectives, this research aims to pave the way for a transformative shift in how educational assessments are conducted, particularly in areas that shape national identity and character. The *MyPatriotic* system seeks not only to measure patriotism more effectively but also to engage students in a more interactive, personalized learning process. This innovation aligns with global goals such as SDG 4, which calls for inclusive and quality education, and SDG 9, which emphasizes innovation in educational infrastructure. Furthermore, it contributes to Indonesia's national education reform by supporting *Kampus Merdeka* and *Merdeka Belajar*, offering a forward-thinking solution that aligns technology with educational values to foster a generation of students who are both knowledgeable and deeply connected to their nation's core values.

2. Problem Statement

Indonesia's educational system faces challenges in assessing soft skills and values, such as patriotism, that are crucial for student development. Traditional methods of assessment, relying on paper and static tools, are no longer effective in gauging these attitudes (Prasetyo, 2021). Moreover, current systems fail to engage students or provide real-time feedback that can guide their development. This study addresses these issues by proposing an electronic assessment system, *MyPatriotic*, which uses a machine learning algorithm, specifically Naive Bayes, to evaluate and foster patriotism in students. The research seeks to modernize the assessment process and support the goals of SDG 4 and SDG 9 by creating a more effective and engaging method for assessing patriotism, aligned with the *Kampus Merdeka* and *Merdeka Belajar* initiatives (Susanto, 2022).

3. Objectives

The primary objectives of this research are:

1. To develop the *MyPatriotic* electronic assessment system that measures patriotic attitudes using the Naive Bayes algorithm.
2. To evaluate the effectiveness of *MyPatriotic* in improving the assessment and engagement of students' patriotic attitudes.
3. To support SDG 4 (Quality Education) by providing a more innovative and interactive assessment tool (Hidayat, 2023).
4. To promote SDG 9 (Industry, Innovation, and Infrastructure) by introducing technological innovation into education and infrastructure (Ahmad, 2021).
5. To support the *Kampus Merdeka* and *Merdeka Belajar* initiatives by utilizing innovative technology for student learning and development.

4. Methodology

4.1. Research Design

This study uses a quantitative approach, which is appropriate for assessing the effectiveness of the electronic assessment system. The ADDIE model was employed to guide the research design, as it ensures a systematic and structured approach to developing and evaluating educational interventions (Prasetyo, 2021). The quantitative methodology allows for the collection and analysis of numerical data to identify patterns and correlations within the dataset, providing measurable insights into the system's performance. By incorporating the ADDIE model comprising Analysis, Design, Development, Implementation, and Evaluation this study ensures that every stage of the intervention is rigorously planned and executed. This framework not only supports the creation of an effective assessment tool but also facilitates iterative improvements based on empirical evidence, enhancing its relevance and utility in educational settings.

4.2. B. Participants

The study involved 135 students from the PPKn department at Universitas Negeri Medan, class of 2024. These students were selected as a representative sample for evaluating the effectiveness of the *MyPatriotic* system in assessing patriotic attitudes.

4.3. C. Data Collection

The data collection process involved the students completing an electronic assessment created through *MyPatriotic*. The system, built using the Naive Bayes algorithm, categorized responses based on predefined indicators of patriotism, such as loyalty, bravery, sacrifice, and love for the country (Sumiatie, 2017; Wibowo, 2023). The system generated immediate feedback and statistical results for analysis. This approach enabled efficient processing of large datasets, ensuring that individual responses were accurately classified according to the identified indicators. By leveraging the capabilities of the Naive Bayes algorithm, the system demonstrated not only precision in analyzing qualitative data but also adaptability in accommodating variations in student input. Furthermore, the immediate feedback mechanism provided a unique opportunity for students to reflect on their responses in real time, thereby

fostering a deeper understanding of the values being assessed. These features enhanced the overall reliability of the data and strengthened the foundation for subsequent evaluations.

4.4. D. Data Analysis

Data were analyzed using statistical techniques to compare the effectiveness of the *MyPatriotic* system against traditional paper-based methods. The analysis focused on accuracy, engagement, and student feedback. The effectiveness of the Naive Bayes algorithm in categorizing responses was also measured.

The comparative analysis provided valuable insights into the strengths and limitations of each method. Metrics such as response accuracy and processing time highlighted the advantages of the *MyPatriotic* system in delivering rapid and reliable results. Additionally, engagement levels were assessed by observing student participation and the ease of use associated with the electronic platform. Feedback from participants was analyzed to evaluate their perceptions of both methods, revealing a preference for the interactive nature of the *MyPatriotic* system. The performance of the Naive Bayes algorithm was further examined by measuring its classification precision against manual evaluations, ensuring that the categorization process was both efficient and aligned with the intended indicators. This comprehensive approach underscored the potential of technology to enhance educational assessments in meaningful ways.

5. Results and Discussion

5.1. Statistical Results

The implementation of the *MyPatriotic* system yielded the following findings:

A. Engagement and Understanding:

80% of students reported that the electronic assessment was more engaging and easier to understand compared to traditional paper-based assessments. This finding is significant because it suggests that the digital format of the assessment was not only more engaging but also easier for students to interact with. The ease of use of *MyPatriotic* was a major factor in improving student participation and understanding (Hidayat, 2023). Unlike traditional methods, which can be monotonous, the electronic platform incorporated multimedia elements and interactive features that appealed to students, thereby enhancing their overall experience.

B. Immediate Feedback:

70% of students indicated that the immediate feedback provided by the system helped them better understand their strengths and areas for improvement in terms of patriotism. The feedback mechanism of *MyPatriotic* proved to be an effective tool for personalizing learning. According to Prasetyo (2021), immediate feedback is crucial for students' growth, especially when dealing with abstract concepts like patriotism, as it allows them to reflect on their responses and adjust their attitudes accordingly. The real-time nature of the feedback also allowed students to make adjustments before the final assessment, leading to improved understanding and application of patriotic values.

C. Improvement in Patriotic Attitudes:

75% of students showed improvement in their patriotic attitudes after using the *MyPatriotic* system, as reflected in their final scores on the assessment. This statistic demonstrates the effectiveness of *MyPatriotic* in fostering national pride and commitment. The improvement in attitudes can be attributed to the targeted nature of the assessment, which focused on key

indicators of patriotism, such as loyalty, bravery, sacrifice, and love for the country (Sumiatie, 2017). The structured approach of the system in evaluating these traits likely provided students with a clear understanding of their own values, leading to greater alignment with national ideals.

D. Accuracy of Naive Bayes Algorithm:

The Naive Bayes algorithm used in the *MyPatriotic* system demonstrated a remarkable 92% accuracy in categorizing student responses. This high level of precision in classification is significantly higher than the accuracy achieved by traditional methods, which often fail to capture the nuanced responses of students regarding their attitudes toward patriotism. As noted by Ahmad (2021) and Susanto (2022), machine learning algorithms like Naive Bayes have the ability to handle large datasets and provide more reliable classifications, which is particularly important when measuring abstract concepts. The 92% accuracy suggests that the algorithm is effective in identifying patterns in student responses that reflect their true patriotic attitudes.

The findings from the statistical results provide compelling evidence of the *MyPatriotic* system's ability to engage students more effectively than traditional assessment methods. The 80% of students who found the system more engaging and easier to understand underscores the importance of incorporating interactive, digital elements into educational tools. In an era where students are increasingly accustomed to digital interfaces and multimedia, traditional paper-based assessments are becoming less appealing. The integration of interactive features in *MyPatriotic* not only improved engagement but also enhanced students' overall comprehension of the subject matter, which is vital when dealing with complex concepts like patriotism (Hidayat, 2023). This shift towards digital learning tools is in line with the global trend of utilizing technology to make education more accessible, engaging, and effective.

The immediate feedback feature, which 70% of students found helpful, further highlights the advantages of a digital assessment system. Providing real-time feedback allows students to reflect on their responses and make necessary adjustments, thereby deepening their understanding of the material. As Prasetyo (2021) notes, feedback is particularly important when assessing attitudes and values, as it encourages reflection and critical thinking. In the case of patriotism, where emotional and cognitive elements are interwoven, this kind of feedback is crucial for fostering personal growth and national identity. By offering insights into students' strengths and areas for improvement, *MyPatriotic* fosters an environment where students are motivated to refine their attitudes and align them more closely with the core values of patriotism.

The 75% improvement in patriotic attitudes among students is another noteworthy outcome of this study. This statistic demonstrates that the *MyPatriotic* system is not just an assessment tool, but also an intervention that contributes to the development of students' national pride. The system's focus on key indicators of patriotism, such as loyalty, bravery, and love for the country, provides students with a clear framework for understanding and internalizing these values (Sumiatie, 2017). This structured approach allows for a more focused and measurable assessment of abstract concepts, enabling educators to track progress over time and tailor their teaching strategies accordingly. The significant improvement in attitudes suggests that *MyPatriotic* is effective in not only measuring patriotism but also in cultivating it, making it a valuable tool for national character development.

Finally, the accuracy of the Naive Bayes algorithm at 92% further demonstrates the technological sophistication behind *MyPatriotic*. This high level of precision in categorizing responses is crucial, as it allows for more reliable and valid results when assessing subjective concepts like patriotism. Traditional methods often fail to capture the nuances of student attitudes, leading to incomplete or inaccurate assessments. In contrast, machine learning algorithms, such as Naive Bayes, excel at identifying patterns in large datasets and providing a more accurate representation of student attitudes. As noted by Ahmad (2021) and Susanto (2022), the ability of Naive Bayes to handle complex data sets and make precise

classifications is especially valuable in educational settings, where subjective responses need to be analyzed systematically. The accuracy of the algorithm ensures that the results of *MyPatriotic* are not only reliable but also meaningful, providing a solid foundation for future educational interventions and policy-making.

5.2. Discussion

The results from the implementation of *MyPatriotic* reveal several critical insights into the role of digital assessments in improving education. The significant improvements in student engagement and understanding of patriotic values underscore the potential for technology to enhance the learning experience.

1. Digital Engagement vs. Traditional Methods:

One of the most compelling results is the 80% of students who reported that the *MyPatriotic* system was more engaging and easier to understand. This marks a clear shift from the limitations of traditional paper-based assessments, which tend to be passive and one-dimensional. The incorporation of digital tools into education is aligned with SDG 4 (Quality Education), which calls for the use of innovative technology to enhance educational quality. The success of *MyPatriotic* in engaging students supports the idea that digital assessments can offer a more interactive, dynamic approach to evaluating students' attitudes, making the learning process not only more interesting but also more effective (Hidayat, 2023).

2. The Role of Immediate Feedback in Student Learning:

The 70% of students who indicated that immediate feedback improved their understanding of patriotism reflect the growing importance of feedback in modern education. According to Prasetyo (2021), feedback is a crucial element in the learning process, especially when dealing with abstract concepts like patriotism. The ability of *MyPatriotic* to provide real-time feedback enabled students to immediately assess their understanding and adjust their responses, reinforcing learning. This iterative process of self-assessment is known to enhance student retention and application of knowledge, thus contributing to more meaningful and long-term learning outcomes.

3. Impact on Patriotic Attitudes:

The 75% improvement in patriotic attitudes after using *MyPatriotic* points to the effectiveness of this system in promoting the values of nationalism. Traditional methods of assessing patriotism often fail to engage students meaningfully, and they lack the capacity to provide feedback that would lead to attitude changes. In contrast, *MyPatriotic* not only assessed students' patriotism but also actively contributed to shaping it by providing immediate feedback, reflection opportunities, and a personalized learning experience. The system's ability to identify areas of weakness and encourage improvements in specific aspects of patriotism (such as loyalty or sacrifice) allows it to foster a deeper understanding of national values among students.

4. Technological Innovation and the Naive Bayes Algorithm:

The high accuracy rate of the Naive Bayes algorithm 92% highlights the power of machine learning in enhancing educational assessments. Unlike traditional manual grading systems, *MyPatriotic* uses an algorithm that can analyze patterns in student responses and classify them accurately based on predefined categories of patriotism. This capability is particularly important in measuring attitudes, which are complex and difficult to quantify. As noted by Ahmad (2021) and Susanto (2022), the use of machine learning models like Naive Bayes can increase the reliability and precision of assessments, making them more effective and trustworthy tools for measuring intangible attributes like patriotism.

5. **Alignment with SDG 4 and SDG 9:**

The findings of this study underscore the alignment of *MyPatriotic* with both SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure). By utilizing technology to improve the educational assessment process, this system contributes to the achievement of SDG 4, which emphasizes the need for innovative and quality education systems. Moreover, the use of machine learning and digital tools supports SDG 9, which calls for technological innovation in educational infrastructures. As the *MyPatriotic* system demonstrates, integrating digital tools in educational settings can foster innovation, making learning more interactive, personalized, and scalable.

6. **Supporting Kampus Merdeka and Merdeka Belajar:**

In addition to supporting global sustainability goals, *MyPatriotic* also aligns with national initiatives such as *Kampus Merdeka* and *Merdeka Belajar*. These programs emphasize the integration of technology in education, aiming to create a more flexible, inclusive, and innovative learning environment. By leveraging *MyPatriotic* to measure and improve patriotic attitudes, this research contributes to these national initiatives, demonstrating how digital tools can enhance both academic and character education. The system's success illustrates how technology can be used to not only assess knowledge but also shape student attitudes and values in line with national objectives.

7. **Limitations and Areas for Improvement:**

Despite the promising results, there are limitations to this study that should be considered. While 75% of students showed an improvement in their patriotic attitudes, 25% did not report significant changes. This discrepancy suggests that factors beyond the digital assessment system such as personal background, social influences, and initial attitudes may also play a role in shaping students' patriotism. Future research should explore these factors in more depth, as well as investigate whether the improvements in patriotism are sustained over time.

8. **Future Research Directions:**

Further studies should expand the sample size beyond the PPKn department to include students from various disciplines. This would provide a more comprehensive understanding of how the *MyPatriotic* system works across different academic fields and demographic groups. Additionally, longitudinal studies are needed to assess the long-term impact of digital assessments on student attitudes and their real-world applications. This would help determine whether the positive effects of the system are maintained and whether they translate into tangible improvements in national engagement and character development.

Moreover, future research should explore the integration of additional machine learning algorithms to assess the effectiveness of different approaches in measuring complex student attitudes, such as patriotism. While the Naive Bayes algorithm showed promising results in this study, other algorithms like Support Vector Machines (SVM) or Random Forests could offer further insights or improve classification accuracy. A comparative analysis of different models could determine which algorithm yields the most accurate and reliable measurements, potentially providing a more robust tool for educational assessments.

In addition, it would be valuable to assess the potential impact of cultural and regional factors on the effectiveness of *MyPatriotic* across various geographical locations. As patriotism can be shaped by diverse cultural norms, understanding how students from different regions or backgrounds respond to the system could enhance its adaptability and universality. Tailoring the assessment system to account for these cultural differences could ensure that it is relevant and meaningful to a broader student population, thus increasing its effectiveness in fostering patriotism.

Another area for future investigation is the impact of gamification on the MyPatriotic system. Research suggests that incorporating game-like elements, such as points, badges, or leaderboards, into educational tools can further increase student engagement and motivation. By exploring whether such gamified features can enhance the MyPatriotic system, future studies could determine whether they contribute to a more immersive learning experience and whether they have any additional effect on students' attitudes toward patriotism.

Finally, considering the rapid advancement of technology and changes in student learning behaviors, it is crucial for future studies to continuously evaluate and update the MyPatriotic system to keep pace with emerging trends in educational technology. This could include the integration of augmented reality (AR), virtual reality (VR), or artificial intelligence (AI) to make the system even more interactive and immersive. Regular updates and iterative improvements will ensure that MyPatriotic remains a relevant and effective tool for enhancing students' understanding of patriotism and their connection to national values.

The results of this study show that the MyPatriotic system has significant potential to revolutionize how patriotism is assessed among students. However, while the Naive Bayes algorithm showed excellent results, future research should explore the integration of additional machine learning models to compare and assess the effectiveness of different approaches. For instance, Support Vector Machines (SVM) or Random Forests are two other algorithms commonly used in classification tasks and may offer distinct advantages over Naive Bayes in certain contexts. SVM, known for its ability to handle high-dimensional data, could help improve classification accuracy when dealing with more complex and nuanced data, such as that involved in measuring abstract concepts like patriotism. Similarly, Random Forests, an ensemble learning method, could enhance the robustness and precision of the analysis by aggregating multiple decision trees to avoid overfitting and ensure generalizability. A comparative analysis of these models would provide deeper insights into which algorithm delivers the most reliable results, ultimately creating a more accurate and adaptable system for educational assessments.

Additionally, the study's focus on the PPKn department at Universitas Negeri Medan provides valuable insights, but it is crucial to consider the potential impact of cultural and regional factors on the effectiveness of the MyPatriotic system. Patriotism is a concept deeply influenced by cultural norms, historical contexts, and regional identities. As Indonesia is a diverse country with varying cultural influences across its regions, it is important to assess whether MyPatriotic's current framework resonates equally well with students from different cultural backgrounds. Future research should explore how students from other regions or ethnic groups within Indonesia respond to the system. By understanding these regional differences, it would be possible to tailor the system's content, feedback, and assessment criteria to ensure it is culturally relevant and sensitive. A culturally adaptive MyPatriotic system could help bridge the gap between national and local identities, making it more meaningful and impactful across diverse student populations.

Another promising avenue for future research is the integration of gamification elements into the MyPatriotic system. Gamification has become an increasingly popular strategy in educational technology because of its potential to enhance student engagement, motivation, and retention. Research has shown that incorporating game-like features such as points, badges, and leaderboards can create a more immersive and enjoyable learning experience (Prasetyo, 2021). These features not only make learning more fun but also encourage students to take an active role in their own progress, increasing the likelihood that they will engage more deeply with the content. Integrating gamification into MyPatriotic could enhance the overall user experience and potentially increase students' emotional connection to the assessment process. Future studies could investigate whether such gamified features would lead to

further improvements in student attitudes toward patriotism, as well as their long-term retention of patriotic values.

The evolution of educational technology also demands that systems like MyPatriotic be updated regularly to stay in line with technological advancements. As students become more accustomed to immersive learning technologies, there is a growing need for systems that incorporate new tools like augmented reality (AR), virtual reality (VR), and artificial intelligence (AI). These technologies could elevate the MyPatriotic system by providing even more interactive, engaging, and personalized experiences. For example, incorporating AR or VR could allow students to virtually experience historical moments or interact with dynamic scenarios that highlight patriotism in action, making the concept of national pride more tangible. AI could also be used to adapt the system's feedback to each student's unique learning style, further enhancing the personalized nature of the assessment. To ensure MyPatriotic remains effective and relevant, future research should explore the potential integration of these advanced technologies, along with continuous updates to the system to reflect changing trends in digital learning environments.

Moreover, the growing prevalence of online learning and digital education necessitates that the MyPatriotic system be evaluated not only in traditional classroom settings but also in online or hybrid learning environments. With the shift towards digital education, especially post-pandemic, it is important to explore how MyPatriotic can be utilized in remote or distance learning contexts. Research should investigate how students engage with the system when they are not physically present in a classroom and whether the system remains as effective in fostering patriotism in an online format. This is particularly relevant as more educational institutions embrace hybrid or fully online learning models, which require innovative assessment systems that can function seamlessly in digital spaces.

Finally, while MyPatriotic's primary focus is on improving patriotic attitudes, it would also be valuable to explore its potential in fostering broader socio-emotional skills. As the world faces increasingly complex global challenges, fostering empathy, cultural awareness, and a sense of social responsibility among students is becoming more critical. Future research could investigate whether systems like MyPatriotic can be expanded to assess and promote other values such as empathy, global citizenship, and social justice. By extending the system's capabilities to measure a broader range of attitudes and behaviors, MyPatriotic could evolve into a more comprehensive tool for character development, ultimately preparing students not only to be patriotic citizens but also engaged and responsible members of the global community.

To support these future directions, the development of MyPatriotic should also include ongoing evaluations of its effectiveness through long-term studies. While initial findings are promising, it is essential to assess whether the system's impact on student attitudes is sustained over time. Longitudinal studies could help determine whether the improvements in patriotic attitudes observed after using MyPatriotic are lasting or whether they diminish once students no longer interact with the system. Additionally, it would be valuable to compare the impact of MyPatriotic against other traditional or digital assessment methods to assess whether it offers superior benefits in terms of student engagement, understanding, and attitude development.

Moreover, it would be useful to explore the potential scalability of MyPatriotic beyond the confines of individual institutions. The system could be expanded to include students from various educational levels, ranging from high schools to universities, as well as across different countries or regions. This would not only provide a broader perspective on how patriotic values are perceived by diverse student populations but also enhance the system's ability to foster a sense of shared global identity. By

examining the scalability of MyPatriotic, future research could identify key strategies for adapting the system to different educational contexts and cultures, ensuring its global applicability.

In conclusion, while the MyPatriotic system represents a significant step forward in digital assessment, ongoing research and innovation are essential to fully realize its potential. By exploring additional machine learning models, integrating cultural considerations, incorporating gamification elements, and leveraging emerging technologies, MyPatriotic can continue to evolve into a more powerful and versatile tool for shaping students' patriotic attitudes and character development. As the educational landscape continues to shift, it is critical that systems like MyPatriotic remain dynamic, adaptable, and forward-thinking to meet the ever-changing needs of students and educators alike.

6. Conclusion

The results of this study demonstrate the promising potential of the *MyPatriotic* system in improving the measurement of patriotic attitudes through digital assessments. The use of the Naive Bayes algorithm, coupled with real-time feedback, allowed for a more accurate, efficient, and engaging assessment process compared to traditional paper-based methods. The study revealed that 80% of students found the system more engaging, while 70% appreciated the immediate feedback that helped them identify their strengths and areas for improvement. This demonstrates a significant advancement in the way we can assess subjective attitudes like patriotism, moving beyond static, often disengaging formats into more dynamic, personalized tools.

Moreover, the 92% accuracy rate of the Naive Bayes algorithm in categorizing student responses highlights the robustness of machine learning applications in educational assessments. This indicates that *MyPatriotic* is not just a novelty but a reliable tool capable of providing consistent and precise measurements of complex concepts. The system's ability to provide immediate feedback also speaks to the growing demand for real-time data in educational settings, where timely information can greatly enhance student learning and engagement (Wibowo, 2023; Hidayat, 2023).

From a broader perspective, the findings of this study align with the objectives of SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure), demonstrating how technology can be harnessed to improve educational quality and infrastructure. By integrating the *MyPatriotic* system into the educational process, this research illustrates how digital tools can support the development of national character, a key element of Indonesia's educational policies, such as Kampus Merdeka and Merdeka Belajar. These initiatives emphasize the importance of flexible, student-centered learning that fosters both academic and personal growth, and *MyPatriotic* fits squarely within this vision by enhancing students' understanding and practice of patriotism in an engaging and effective way.

While these results are promising, it is important to acknowledge that the study's scope was limited to a single department and cohort at Universitas Negeri Medan. Further research is needed to explore how *MyPatriotic* performs across different disciplines and diverse student populations. Additionally, longitudinal studies will be crucial in assessing whether the positive effects observed in this study are sustained over time and whether they translate into real-world improvements in national engagement and citizenship. As educational technology continues to evolve, the integration of systems like *MyPatriotic* has the potential to significantly reshape how we think about values-based education, providing deeper insights into student development and contributing to a more digitally literate and engaged society.

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