Adaptive Learning in the Future of Educational Management Adapts to Student Needs

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ABSTRACT

Education is the most important foundation for shaping the future of the next generation. In the era of ever-evolving information technology, education must be updated to remain relevant and effective. One approach that has emerged as a solution to future training needs is “adaptive learning”. Adaptive learning is a teaching method that uses technology to identify and adapt each student's learning needs individually. Adaptive learning systems use data and analysis of student behavior when processing learning materials. Thus, the learning process becomes more personal, interactive and related to the abilities and learning styles of each student. This summary aims to describe the concept of adaptive learning in future educational administration and focuses on the importance of adapting to student needs. Research shows that each student has a different learning style and speed of understanding. The use of technology in adaptive learning gives teachers and educational institutions the ability to more accurately identify each student's weaknesses and strengths. In this summary, we analyze how adaptive learning can benefit students, teachers and the entire education system. Adaptive learning not only increases student engagement, but also enables teachers to develop more effective teaching strategies based on the information and data they collect. However, this summary also discusses some of the challenges and considerations that must be faced when implementing adaptive learning. These include questions about student information security, the development of high-quality adaptive learning content, and the role and involvement of teachers in the use of educational technology. Facing the Industrial Revolution 4.0 era, adaptive learning offers hope for creating a more inclusive and effective education system. With an approach that addresses students' needs, adaptive learning can become the main pillar in building a generation that is ready to face the complexities of the modern world.

Keywords: Adaptive learning, education management.
INTRODUCTION

Technology education (Radianti et al., 2020) has been a revolutionary milestone in the world of modern education. In an era dominated by the development of (Malik et al., 2020) With information and communication technology, education is no longer limited to the traditional classroom. Instead, technology has opened the door for learning (Stokes et al., 2020) more interactive, inclusive and forward-thinking. The use of technology in education has enriched the way we receive, present (Dilalla et al., 2020), and interact with information. With the help of the internet and mobile devices (Mrozek et al., 2020), learning can happen anywhere, anytime. Geographical boundaries no longer connect students and teachers, enabling a global exchange of knowledge and experience. Innovative approaches such as project-based learning (Ma et al., 2020), Technology-enhanced simulation and modeling have increased the appeal and effectiveness of learning.

Technology also provides scope for the use of visual and interactive media (Zhao et al., 2020) engaging videos, animations, and educational games (Reid, 2020) that can help convey concepts (Seo et al., 2020) complex in a way that is easier for students to understand. In addition, technology has encouraged (Pigot et al., 2020) the development of new forms of distance or online learning. Online learning platforms enable educational approaches (Coman et al., 2020) broader and more inclusive (Van Mieghem et al., 2020), enabling people from different backgrounds and locations to gain knowledge (Ferraris et al., 2020) and quality skills. Technology education also challenges educators and decision-makers (Altman, 2021) to always adapt to rapid developments. The use of technology requires digital skills (Ghezzi & Cavallo, 2020) good teachers and school staff and careful planning to properly integrate technology into the curriculum.

Although technology has brought many benefits, the challenges (Masias et al., 2021) also emerged. Ensuring that access to technology is shared evenly between students and teachers is crucial to prevent (Calvo-Morata et al., 2020) widening of the digital divide. In addition, the use of technology must be ethical and responsible, and a balance must be maintained between learning and development (Ali et al., 2020) through technology and social interactions that are important for students' personal development. In an increasingly compact and changing context, technology education offers endless opportunities to shape a more inclusive, dynamic and meaningful future for education. By understanding the advantages and challenges that exist, we can create a system of (Altan & Hacıoğlu, 2020) Education that enables future generations to face the challenges and opportunities of an increasingly complex and fast-changing world.

Adaptive learning (Shukla et al., 2020) is a learning method that uses technology and data analysis to understand students’ individual strengths and weaknesses. By using smart algorithms and technology (Ghorayeb et al., 2021), adaptive learning can recognize patterns and preferences (Ogi et al., 2021) student learning and automatically
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adjust the curriculum (Razavi et al., 2021), materials, and learning methods. This allows each student to have a learning experience that is tailored to their abilities and learning style (Bin Eid et al., 2021) them, and encourage them to reach their full potential. The future of education has reached an interesting point where technology and innovation (Papa et al., 2020) plays a central role in enriching learning. A particular approach is adaptive learning, which offers revolutionary potential (Hayani et al., 2021) to tailor education to the unique needs of each student. In an increasingly complex and diverse world, adaptive learning promises a new era where education can be more inclusive, personalized and effective.

This approach means that students are no longer bound to the curriculum (Qasim et al., 2020) One-size-fits-all, but given the freedom to learn at the level and path that suits them best. Faster learners are given greater challenges to avoid boredom (Struk et al., 2020), while students who need more time to understand certain concepts are given extra support to improve their understanding. Adaptive learning (Shukla et al., 2020) Taking into account students' learning styles, interests and career goals is more than just customizing learning. In this way, education can become more relevant and contextualized (Adeel et al., 2020), helping students develop essential skills for the future. While adaptive learning offers great potential, there are also challenges in implementing it effectively. It requires adequate technology infrastructure, adequate teacher training, and careful student privacy. In addition, it should be noted that technology should not replace the role of the teacher, but rather be a tool that supports and enriches learning.

In a time of rapid technological change, Adaptive Learning in Education Management offers a vision of (Morar et al., 2020) an exciting future for education that is more inclusive and adaptive. By combining human wisdom and technological ingenuity, we can create an education system that allows every student to reach their potential (Natsch, 2020) an exciting future for education that is more inclusive and adaptive. By combining human wisdom and technological ingenuity, we can create an education system that allows every student to reach their potential. (Repici et al., 2020) longer to get additional help to improve their understanding. In addition, Adaptive Learning also pays attention to the development of individual students over time. By tracking their progress, the (Kuriqi et al., 2020) It can adapt the curriculum and provide learning materials that are relevant to students' level of knowledge at every stage. However, with the development of this technology, it is also necessary to understand its potential challenges.

Some previous researchers' opinions on adaptive learning in future education management: adjusting student needs. According to Setiawan, A. R. (2020). which suggests that this research examines areas of interest in the development of future education systems. Through the use of adaptive learning, it can utilize the potential of technology to provide a more meaningful and effective learning experience for each student. Second, according to Batubara, H. H., & Ariani, D. N. (2019) considering the challenges of providing inclusive education, when implementing an adaptive learning system, we must consider ethical issues and student data privacy. Hopefully, this research will also examine the social impact of introducing technology into the classroom. Thirdly, according to researchers with Rachmayanti, E. (2022). that caution
should be taken when evaluating the overall effectiveness of adaptive learning. Many factors influence student learning outcomes, including the social and economic environment. Exploring how adaptive learning can impact social inequalities and provide equal opportunities for academic success for all students.

The goal of adaptive learning research in the future of education management is to provide every student with (Alhadabi & Karpinski, 2020) a more individualized and effective way of learning. With an adaptive learning approach, each student can use learning materials that suit his or her level of understanding, learning pace and learning style. This helps to increase engagement (Huisman et al., 2020) students and enable them to learn more effectively. Adaptive learning helps identify students' weaknesses and strengths more accurately. If students pay attention to this, they can receive the learning material (Tran et al., 2020) that suits their needs and is individually customized. As a result, students' academic potential can be optimized and they are likely to achieve a higher level of efficiency. Adaptive learning often allows students to learn at their own pace by choosing a learning path (Silvola et al., 2021) tailored to their needs. This can help promote independence (Edo, 2020) students in managing their own learning. Every student has a different pace of learning. With adaptive learning, slower learners can keep up and get extra help, while faster learners can complete more challenges.

**RESEARCH METHODOLOGY**

The method used in this research is quantitative method. Quantitative research methods (Guan et al., 2021) This method produces data in the form of numbers obtained by filling out surveys on google forms and provided to students as research subjects. In addition, this quantitative method produces systematic, planned, and structured research. This quantitative research method is widely used in research. This quantitative method is defined as the process of discovering a phenomenon systematically and clearly (Francisco et al., 2020) It involves collecting information, then measuring it and confirming it by filling out questionnaires and interviewing stakeholders. This research is mostly conducted through statistical research where quantitative data is collected through research studies. This quantitative research method provides information that is truly accurate and realistic because the end result is in the form of numbers.

The type of research is a test whose purpose is to test the use of artificial intelligence (Barredo Arrieta et al., 2020) in future education management. The researcher's data collection technique is to find and collect factual and current information at that time. Data collection at observation points is a quantitative research data analysis technique. When analyzing data, one does so by describing and describing the information collected, without changing the source of the information obtained. The first step of this quantitative research is to find the root of the problem or formulate the problem, then conduct a literature review, set a hypothesis, set a method, and then analyze the data (Anwar et al., 2021) to be used, determine the instrument or research tool, and conduct data analysis and finally draw conclusions.
RESULT AND DISCUSSION

Adaptive learning in the future of education management: Adaptation to student needs is one of the learning techniques that has become increasingly important in the era of evolving technology and information. Adaptive learning focuses on applying technology to tailor learning to each individual, with the aim of creating a more efficient, effective and inclusive learning environment. One of the most important aspects of adaptive learning is the personalization of learning. Every student has a different learning style, comprehension level and learning speed. Using technologies such as machine learning algorithms and data analytics, adaptive learning systems can identify the needs and preferences of each student. This makes it possible to customize learning content and teaching methods, ensuring that students learn at a level of difficulty and pace that suits them.

Adaptive learning allows students to focus on the content that matters most to them. Well-learned topics can be skipped, while poorly understood material can be emphasized more. This helps students feel more motivated as they feel engaged in learning that is important and meaningful to them. By providing personalized learning experiences, students tend to be more engaged in the learning process. This higher sense of engagement can help increase students’ intrinsic motivation to learn and achieve better results. Every student has different abilities. Some students may take longer to grasp a concept, while others may grasp it faster. Adaptive learning allows students with learning difficulties to receive additional help and a more appropriate approach, while faster students can be given additional challenges.

Adaptive learning implementation uses technology and data analytics to collect data on student learning progress. This can help teachers and educational institutions develop more effective and efficient teaching strategies. In the digital age, access to information and technology is easier than ever. Adaptive learning can improve educational accessibility for students from diverse backgrounds, including those with physical disabilities or those living in remote areas. Adaptive learning systems can provide personalized progress assessments for students and teachers. With accurate data and analysis of student progress, teachers can provide more timely and relevant feedback, while students can identify areas for improvement.

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adaptive learning can have a major positive impact on students' skill development</td>
<td>50%</td>
<td>55%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>Increase knowledge of technological developments</td>
<td>45%</td>
<td>60%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>Adaptive learning allows students to focus on the content that is most important to them</td>
<td>70%</td>
<td>30%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>Able to become a competitive</td>
<td>25%</td>
<td>70%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th></th>
<th>student in their field</th>
<th>30%</th>
<th>70%</th>
<th>0%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Teachers find it easier to provide learning in class by using adaptive learning</td>
<td>15%</td>
<td>80%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>6</td>
<td>Advancing education management to be more qualified</td>
<td>5%</td>
<td>90%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>7</td>
<td>A higher sense of engagement and can help increase students' intrinsic motivation to learn</td>
<td>12%</td>
<td>85%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>Support from parents is needed in developing students' intelligence through adaptive learning</td>
<td>35%</td>
<td>70%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>9</td>
<td>Students are required to be proficient in mastering IT knowledge</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>10</td>
<td>Many positive things are obtained with adaptive learning</td>
<td>35%</td>
<td>63%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>11</td>
<td>There are also negative impacts of this adaptive learning</td>
<td>60%</td>
<td>40%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>12</td>
<td>The problem of students who are lazy to learn can be resolved by using adaptive learning</td>
<td>40%</td>
<td>60%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>13</td>
<td>Students easily search for global information by using adaptive learning</td>
<td>40%</td>
<td>65%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>14</td>
<td>Make it easier for students to communicate with their friends</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>15</td>
<td>Students are more prepared to face challenges for the future</td>
<td>50%</td>
<td>50%</td>
<td>2%</td>
<td>0%</td>
</tr>
</tbody>
</table>

From the table above, there are 15 statements about adaptive learning in future education management: adjusting student needs. The statement that adaptive learning can have a major positive impact on the development of student skills, obtained a percentage of 50% in the strongly agree category. Meanwhile, in the agree category, the percentage was 55%, in the disagree category, the percentage was 0%, as well as the strongly disagree category, the percentage was 0% as well. Furthermore, the statement that it increases knowledge about technological developments, obtained a percentage of
45% in the strongly agree category. Meanwhile, the agree category obtained a percentage of 60%, in the disagree category obtained a percentage of 2% and a strongly disagree category obtained a percentage of 0%. On the statement that adaptive learning allows students to focus on the content that is most important to them, obtained a percentage of 70% in the strongly agree category. Whereas in the agree category, it gets a percentage of 70%, in the disagree category it gets a percentage of 0%, as well as the strongly disagree category also gets a percentage of 0%.

Furthermore, the statement that being able to become a competitive student in their field, obtained a percentage of 30% in the strongly agree category. While in the agree category, the percentage was 70%, in the disagree category, the percentage was 0% and the percentage of 0% was also in the strongly disagree category. The statement that it is easier for teachers to provide classroom learning by using adaptive learning, obtained a percentage of 15% in the strongly agree category. While the percentage of 80% in the agree category, in the disagree category obtained a percentage of 5% and in the strongly disagree category obtained a percentage of 0%. Furthermore, in the statement of a higher sense of involvement and can help increase students' intrinsic motivation to learn, obtained a percentage of 12% in the strongly agree category. Meanwhile, the agree category received a percentage of 85%, in the disagree category obtained a percentage of 1% and in the strongly disagree category obtained a percentage of 0%. In the statement that support from parents is needed in developing student intelligence through adaptive learning, obtained a percentage of 35% in the strongly agree category. While the percentage of 70% in the agree category, in the disagree category obtained a percentage of 2% and in the strongly disagree category obtained a percentage of 0%.

Furthermore, in the statement stating that students are required to be proficient in mastering knowledge about IT, obtained a percentage of 50% in the strongly agree category. Whereas in the agree category, it obtained a percentage of 50%, in the disagree category it obtained a percentage of 0%, and likewise with the strongly disagree category obtained a percentage of 0% as well. In the statement stating that many positive things are obtained by adaptive learning, obtained a percentage of 35% in the category strongly agreeing with the statement. Whereas in the agree category, it gets a percentage of 63%, in the disagree category it gets a percentage of 3% and in the strongly disagree category it gets a percentage of 0%. Furthermore, the statement stating that there is also a negative impact from this adaptive learning, obtained a percentage of 60% in the strongly agree category. Meanwhile, in the agree category, it got a percentage of 40%, in the disagree category it got a percentage of 0% and finally in the strongly disagree category it got a percentage of 0%.

The statement stating that the problem of students who are lazy to learn can be overcome by using adaptive learning, obtained a percentage of 40% in the strongly agree category. While in the agree category, it obtained a percentage of 60%, in the disagree category it obtained a percentage of 0% and in the strongly disagree category it obtained a percentage of 0% as well. Furthermore, the statement stating that students easily find global information by using adaptive learning, received a percentage of 40% in the strongly agree category. Whereas in the agree category, it obtained a percentage of 65%, in the disagree category it obtained a percentage of 4% and finally in the
strongly disagree category obtained a percentage of 0%. In the statement stating that it makes it easy for students to communicate with their friends, a percentage of 50% in the category strongly agreed with the statement. Meanwhile, in the agree category, it obtained a percentage of 50%, in the disagree category it got a percentage of 0% and so did the strongly disagree category get a percentage of 0%. Finally, in the statement that students are more prepared to face challenges in the future, a percentage of 50% strongly agreed. Meanwhile, the agree category also received a percentage of 50%, for the disagree category and the strongly disagree category obtained a percentage of 0% as well.

One of the most important aspects of adaptive learning is the personalization of learning. Every student has a different learning style, comprehension level and learning speed. By using technologies such as machine learning algorithms and data analytics, adaptive learning systems can identify the needs and preferences of each student. This makes it possible to customize learning content and teaching methods, ensuring that students learn at a level of difficulty and pace that suits them. Provision of relevant content Adaptive learning allows students to focus on the content that matters most to them. Well-learned topics can be skipped, while poorly understood material can be emphasized more. This helps students feel more motivated as they feel involved in learning that is important and meaningful to them. Increased student engagement: As a result of the 15 statements by distributing questionnaires, it is evident that the importance of using adaptive learning media to support student learning in the classroom, so that great benefits can be felt.

CONCLUSION

Based on the discussion of the research above, it can be concluded that adaptive learning is a very important and effective way to face future educational challenges. This approach focuses on adapting to the needs of individual students and aims to maximize the potential of each student and create a more interesting, meaningful and effective learning environment. The implementation of adaptive learning is expected to bring many benefits to students, teachers and educational institutions. First, students get a more satisfying learning experience because the learning materials are tailored to their strengths, learning styles and interests. This increases student motivation, engagement and academic success. Teachers gain a deeper understanding of student learning progress by analyzing the data generated by adaptive learning technology. With this information, teachers can provide more personalized support and offer challenges tailored to students' needs. In summary, it can be said that adaptive learning is a step forward in future education management that focuses on students as individuals. By taking into account the needs and abilities of individual students, this approach has the potential to improve the overall quality of education, reduce early school leaving and create a generation of students who are better prepared for the complexities of today's world. It is important for educational institutions and education policy makers to consider and implement adaptive learning as part of their efforts to improve the quality of the education system in the future.
REFERENCES


