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## Learning Strategies in the 21st Century: Opportunities and Challenges

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**Abstract.** Education in the 21st century requires teachers as educators to be more adaptive and innovative in developing critical, creative, communicative, and collaborative thinking skills. However, not all teachers are able to play such a role. Therefore, metasa researchers need to re-actualize literacy about learning strategies in the 21st century. The purpose of this study is to re-strengthen the actualization of the concept of learning strategies in responding to challenges in the 21st century. This research method uses Systematic Literature Review (SLR), this study analyzes various scientific sources related to learning strategies that are in accordance with the needs of modern education. The results of this study indicate that there are several learning strategies that can be actualized by teachers in responding to the challenges of education in the 21st century, including examining the definition of learning strategies in the context of 21st century education, identifying criteria for selecting relevant strategies, types of 21st century learning strategies, opportunities utilized in implementing learning strategies and challenges that need to be overcome by educators. These findings are expected to be a reference for education in developing learning strategies that are in accordance with the demands of the times.

**Keywords:** 21st century education, learning strategies, opportunities and challenges

### 1. INTRODUCTION

The development of science and technology in the 21st century has brought significant changes in various aspects of life, including in the world of education. Education is no longer only oriented towards mastering content, but also emphasizes the development of skills that are relevant to global needs. In this context, the education system is required to create a more dynamic, innovative, and student-centered learning environment. Therefore, the selection of relevant learning strategies is very important in ensuring the effectiveness of the learning process.

Along with the shift in the educational paradigm, the learning strategies implemented must be able to accommodate the needs of students in facing the challenges of the digital era. Various studies have shown that effective learning strategies in 21st-century education are strategies that can improve critical thinking skills, creativity, communication, and collaboration (Sutarto, 2023). Thus, the role of teachers is no longer only as a transmitter of information, but also as a facilitator who helps students develop the skills needed to succeed in the future.

Various learning approaches have been developed to address this challenge, such as project-based learning (PBL), as well as digital technology-based learning such as Blended Learning and Flipped Classroom, as well as digital-based learning are some examples of strategies that are increasingly being applied in modern education systems. Choosing the

right learning strategy is a key factor in creating an effective learning process that is relevant to the needs of students (Savitri, et al., 2022).

On the other hand, 21st-century learning strategies also open up various opportunities that can be utilized by educators and students. The integration of technology in learning allows the use of artificial intelligence (AI) to improve the quality of learning. Global collaboration facilitated by the internet also allows students to access international resources and develop cross-cultural communication skills. However, in its implementation there are various challenges that need to be considered, such as the readiness of educators to adopt technology, limited infrastructure, and differences in the level of access to digital devices in various regions. In addition, the paradigm shift from traditional learning to a more innovative model often faces resistance from educators, students, and educational institutions themselves.

Based on this background, this article aims to examine learning strategies in the perspective of 21st century education. The discussion in this article includes the definition of 21st century learning strategies, criteria for selecting relevant strategies, types of appropriate learning strategies, opportunities utilized in implementing this strategy, and challenges that may be faced in the implementation process. With this study, it is hoped that educators can better understand how to choose and implement effective learning strategies and be able to face challenges in this digital era.

## **2. RESEARCH METHODS**

In this study, the method used is Systematic Literature Review (SLR), which is a research approach that aims to collect, evaluate, and synthesize the results of previous studies systematically and in a structured manner. This method is used to gain a deeper understanding of the concept of 21st century learning strategies, criteria for selecting relevant strategies, types of appropriate learning strategies, opportunities utilized in implementing this strategy, and challenges that may be faced in the implementation process. With this approach, research can identify trends, patterns, and key findings in the literature related to 21st century learning strategies, thus providing broader insight into the effectiveness and relevance of these strategies in today's education world.

### **3. RESULTS AND DISCUSSION**

#### **The Nature of Learning Strategies in 21st Century Education**

Strategy comes from the Greek word "strategos" which means an effort to achieve victory in a battle. In general, strategy means a broad outline of a course of action in an effort to achieve predetermined goals. When associated with the teaching and learning process, strategy can be interpreted as general patterns of teacher and student activities in realizing the teaching and learning activities that have been outlined (Pitriyanti, et al., 2022). Meanwhile, learning according to (Prastawati & Mulyono, 2023) is a process of activities that allow teachers to teach and students to receive teaching materials taught by teachers systematically, and influence each other in teaching and learning activities to achieve the desired goals in a learning environment and results that refer to changes with positive results.

Learning strategy is a series or series of planned and structured activities designed by teachers to carry out the learning process so that it can produce an effective and efficient learning process and is able to achieve goals optimally (Savitri, et al., 2022). In 21st century education, learning strategies not only focus on delivering material but must also be able to develop the skills needed in the digital and globalization era. The learning approach must be based on exploration, innovation, and problem solving, so that students can learn actively and contextually. 21st century education demands a transformation in teaching methods, from conventional to more interactive methods, based on information and communication technology, and collaboration. The learning strategies applied must be able to encourage students to think critically, creatively, be able to communicate well, and work together to solve real problems. In addition, learning must also be based on the development of digital competencies in order to adapt to the increasingly rapid development of the times (Soreang, 2018).

According to (Suhaimi & Permatasari, 2021) in the 21st century, learning strategies include approaches that integrate skills, knowledge, and attitudes that are relevant to the demands of today's era. This strategy aims to build high-level thinking skills by placing students at the center of the learning process. Prime examples of strategies implemented in modern education systems include Discovery Learning, Inquiry Learning, Problem Based Learning, and Project Based Learning.

In addition, digital technology plays an important role in 21st-century learning strategies. Blended Learning and Flipped Classroom are examples of strategies that combine face-to-face learning with online learning, allowing flexibility in accessing

materials and increasing active participation of students. By utilizing technology, learning can be more interesting and relevant to the real world. To ensure the effectiveness of 21st-century learning strategies, teachers must have a strong understanding of various teaching methods and the ability to adapt strategies to the needs of students. The learning process designed with the right strategy will create a conducive, innovative, and global competency-oriented learning environment (Astutik & Hariyati, 2021).

### **Criteria for Selecting Relevant Learning Strategies**

Selecting the right learning strategy is very important so that the learning process runs effectively and is able to achieve the goals that have been set. In the context of 21st century education, learning strategies must pay attention to various aspects related to student characteristics, learning objectives, technology integration, and future skill development. The following are the main criteria in selecting relevant learning strategies.

First, Suitability to Student Characteristics. One of the main factors in selecting a learning strategy is to adjust it to the characteristics of the students. Each student has a different learning style, such as visual (easier to understand material through pictures and diagrams), auditory (learning more effectively through hearing), or kinesthetic (learning through physical activity or direct practice). Therefore, the learning strategy chosen must be able to accommodate these various learning styles so that each student can understand the material better. In addition, the level of cognitive and social emotional development of students also needs to be taken into account. For example, elementary school students tend to be more responsive to game-based or exploration learning, while middle school students are more suited to discussion-based and problem-solving learning strategies.

Second, Suitability to Learning Objectives. Every learning has goals that must be achieved, both cognitive (understanding theory), affective (attitudes and values), and psychomotor (practical skills). The learning strategy chosen must be able to support the achievement of these goals in an effective and efficient manner. The learning strategy chosen must also allow for performance-based assessments to measure the extent to which students have achieved the expected competencies (Rahmi, et al., 2024).

Third, Technology Integration in Learning. According to (Chafshah, et al., 2024) technology has become an inseparable part of 21st century education. Therefore, the learning strategy chosen should utilize technology to increase the effectiveness of learning. The use of a Learning Management System (LMS) such as Google Classroom, Moodle, or Edmodo allows teachers to manage learning materials online, give assignments, and conduct evaluations in a more structured manner. In addition, the use of interactive media

such as educational videos, simulations, and gamification can also increase student involvement in the learning process. In some cases, artificial intelligence technology and data analysis have also begun to be applied to adjust learning to the individual needs of students. Thus, technology-based learning strategies can provide a more flexible, interesting, and modern learning experience.

Fourth, Flexibility and Adaptability of Strategy. In good learning strategies, there must be high flexibility and adaptability, meaning that they can be applied in various learning situations and conditions. In the context of modern learning, not all students can learn in the same classroom environment or with uniform methods. Some students may be more comfortable learning independently through online platforms, while others prefer face-to-face learning with direct guidance from teachers. Therefore, learning strategies must be adaptable to both offline, online and blended learning (a combination of both). In addition, learning strategies must also be able to be adjusted to changing conditions, such as when a pandemic occurs which requires learning to be carried out remotely. With high flexibility, learning strategies can remain relevant and effective in various situations.

Fifth, Improving 21st Century Skills. One of the main goals of 21st century education is to equip students with the skills needed to face future challenges. Therefore, the chosen learning strategy must be able to develop 4C skills (Critical Thinking, Creativity, Communication, Collaboration). The chosen strategy must also be able to encourage students to work together in groups, develop communication skills, and learn from different perspectives. Then it must also help students develop creativity and innovation through exploration and independent problem solving. In addition, the strategies implemented must also instill a culture of lifelong learning so that students continue to develop and are able to adapt to changing times (Mahrunnisya, 2023).

Sixth, Improving Student Motivation and Participation. Learning motivation is an important factor that determines the success of learning. Effective learning strategies must be able to build student interest and motivation so that they are more active in the learning process. According to (Suparmini, et al., 2024) one way to increase motivation is to apply fun and challenging learning, such as gamification, where game elements such as points, badges, and challenges are applied in learning to increase student engagement. In addition, learning strategies must also be linked to students' daily experiences and lives to make them more meaningful and relevant to them. For example, in science learning, teachers can use an experiment-based approach or case studies that describe phenomena around students. Thus, students feel more interested and enthusiastic in learning.

The selection of the right learning strategy in 21st century education requires careful consideration. The strategy used must be in accordance with the characteristics of students, learning objectives, and be able to integrate technology effectively. In addition, the strategy must be flexible and adaptable to various learning conditions, and be able to develop 21st century skills, such as critical thinking, creativity, communication, and collaboration. By considering these factors, educators can create learning that is more innovative, interactive, and relevant to the needs of the times. Finally, the learning strategy chosen must also be able to increase student motivation and participation, so that they are more enthusiastic in learning and ready to face future challenges.

### **Types of Learning Strategies in the 21st Century**

In facing the challenges of 21st century education, various learning strategies have been developed to improve the quality of learning and develop skills that are relevant to the demands of the times. One strategy that is increasingly popular according to (Susanti & Hamama, 2019) is the Flipped Classroom, where students learn material independently outside the classroom through videos, e-books, or online learning resources before attending class. With this approach, class time is no longer spent on long lectures, but on discussions, concept exploration, and active problem solving. This method allows students to understand the material at their own pace, while teachers can focus more on guiding and assisting students who are having difficulties.

Second, Project Based Learning (PjBL) is project-based learning in 21st century education applied to encourage exploration and innovation. This learning connects students with problems faced and encountered in everyday life. Starting from the problems that are inventoried and ending with the problem-solving strategy, students continuously study teaching materials and competencies in a structured manner. In project-based learning, problem solving is expressed in real products produced as a work of student creation. This learning also focuses on investigations and investigations carried out by students. For example, in science learning, students can be asked to design a simple renewable energy system, or in social learning they can create an environmental awareness campaign in their community. With this approach, students not only understand the theory but also learn how to apply knowledge in real life (Baroya, 2018).

Third, Blended Learning is a combination of face-to-face learning and online learning, which provides flexibility for students in accessing materials and allows teachers to provide a more personalized learning experience. In this case, students can learn through an e-learning platform that provides materials in the form of videos, interactive

modules, and online quizzes. So that when in class, teachers can use the time to deepen understanding through discussions or project-based activities. Blended learning has been widely applied in various schools or universities because it can increase learning efficiency and provide a more dynamic experience (Utrari, et al., 2020).

Fourth, Gamification (Game-Based Learning) which is used to increase student motivation and engagement. By using game elements such as points, levels, challenges, rewards, learning becomes more fun and effective. For example, in mathematics learning, teachers can use educational game applications that provide counting challenges with a virtual score and prize system. This strategy not only makes students more enthusiastic about learning, but also improves memory and understanding of concepts in a more interesting way. However, teachers need to ensure that the game elements applied remain in line with the learning objectives, so that students do not only focus on the game but also get maximum academic benefits.

Finally, STEAM (Science, Technology, Engineering, Arts, and Mathematics) is a learning strategy that emphasizes a cross-disciplinary approach that connects science, technology, engineering, art and mathematics in one learning activity. In this case, students are invited to think creatively and innovatively in solving problems (Fakhrunnisa, et al., 2023). For example, in a STEAM project, students can design and make a mini bridge from simple materials by considering aspects of mathematics (measurement), engineering (structure), and art (design). This strategy is effective in developing 21st century skills such as problem solving, creativity, and teamwork.

### **21st Century Learning Strategy Opportunities**

21st century learning strategies provide various opportunities that can be utilized to improve the quality of education. One of the biggest opportunities is the integration of technology in learning, which allows the use of digital devices, e-learning platforms, artificial intelligence (AI), and virtual reality (VR) to create a more engaging and interactive learning experience. With this technology, students are not only recipients of information, but can also actively participate in the learning process through simulations, virtual experiments, and interactions with materials more dynamically. In addition, technology also allows for personalization of learning, where students can learn according to their own speed and learning style, thereby increasing the effectiveness of the learning process.

In addition, learning becomes more flexible and personal through blended learning and flipped classroom models. Blended learning combines face-to-face learning with

online learning, providing opportunities for students to access materials anywhere and anytime. Meanwhile, flipped classrooms change the traditional learning paradigm by providing materials before the learning process in class, so that class time can be used for in-depth discussions and problem solving. With this approach, students have a greater opportunity to understand concepts independently before discussing with teachers and friends, thus increasing their engagement in learning.

Another opportunity that emerges in 21st-century education is global collaboration and access to international resources. With the help of the internet and online learning platforms, educators and students can connect with academic and professional communities around the world. They can take online courses from leading universities, participate in cross-country collaborative projects, and share insights with experts in a particular field. This opens up new horizons for students to gain broader learning experiences and enrich their insights into various global perspectives. In addition, this collaboration can also help students develop cross-cultural communication skills, which are very important in the era of globalization (Priyanti, et al., 2023).

21st century learning strategies also support the development of critical thinking, creativity, communication, and collaboration (4C) skills that are much needed in the future world of work. With approaches such as project-based learning and problem-based learning, students are trained to face real challenges, find innovative solutions, and work in teams to complete tasks. These skills not only improve their academic understanding but also prepare them to become individuals who are able to adapt to changes and demands of an increasingly dynamic world of work (Rose, et al., 2024).

Finally, another great opportunity is to increase student motivation and engagement in learning. By implementing experiential learning strategies, such as gamification and challenge-based learning, students can be more motivated to learn because the learning process becomes more fun and meaningful. Gamification, for example, adopts game elements such as points, badges, and challenges to increase student engagement. This approach can make students more enthusiastic in completing tasks more actively in exploring learning materials. Thus, the opportunities offered by 21st century learning strategies can help create a more innovative, effective and modern learning environment.

### **Challenges of Learning Strategies in the 21st Century**

In implementing learning strategies that are in accordance with the needs of 21st century education, there are various challenges faced by educators, students, and educational institutions. These challenges arise due to changes in the educational paradigm

that are increasingly oriented towards technology, high-level thinking skills, and project-based and collaborative learning.

One of the main challenges is the lack of teacher readiness in adopting innovative learning strategies. Many teachers are still accustomed to conventional learning methods such as lectures and drills, so they have difficulty in implementing technology-based learning models or student-centered learning. In addition, limited training and professional development for teachers are also obstacles in mastering more complex strategies, such as project-based learning or flipped classrooms.

The next challenge is the lack of support from the school environment and policies that are not yet optimal in encouraging learning innovation. In some cases, schools are still trapped in a curriculum that is too dense so that it does not provide enough space for the exploration of project-based or technology-based learning strategies. In addition, the high administrative burden on teachers often reduces their time to design innovative learning. Therefore, education policies must be more flexible and support the implementation of strategies that are relevant to the needs of the times. Schools also need to create a culture of innovation by providing space for teachers to experiment with more creative and effective learning methods (Putri, et al., 2024).

In addition, limited access to technology and infrastructure that supports digital learning. Not all schools, especially in remote areas, have adequate facilities such as stable internet access, computer devices, or projectors that support technology-based learning. This causes a gap in the implementation of modern learning strategies, where schools that have complete facilities tend to be more advanced than schools that still have minimal resources.

An equally important challenge is the motivation and readiness of students to accept more active learning strategies, which is also a challenge in itself. Some students are still accustomed to passive learning patterns, where they only receive material from teachers without participating actively. When strategies such as project-based learning or collaborative learning are applied, some students may have difficulty working together, thinking critically, or completing more complex tasks (Harahap, et al., 2024).

By understanding the various challenges that exist and implementing the right solutions, 21st century learning strategies can be more effectively implemented in various conditions. Increasing teacher capacity, strengthening educational infrastructure, increasing student motivation, and supporting policies that support innovation are the main keys to realizing learning that is in accordance with the demands of the times.

#### **4. CONCLUSION AND SUGGESTIONS**

##### **Conclusion**

In facing the challenges and developments of 21st century education, innovative, flexible, and technology-based learning strategies are very important. 21st century education demands a learning system that can develop essential skills such as critical thinking, creativity, communication, and collaboration (4C), which are needed to prepare students to face an increasingly complex and technology-based world. Various types of strategies such as flipped classroom, project-based learning, blended learning, gamification and STEAM, are relevant and effective learning models in supporting the development of these skills. In addition, existing opportunities such as technology integration, flexible learning, and global collaboration also provide great potential to improve the quality of education. However, the implementation of this strategy is not free from challenges such as limited infrastructure, educator readiness, and resistance to change.

##### **Suggestions**

To optimize the implementation of 21st century learning strategies, educators need to continue to improve their competencies, especially in the use of technology and more innovative learning methods. Continuous professional training and development must be provided to teachers so that they can adapt learning strategies that are in accordance with the needs and developments of the times. In addition, collaboration between schools, government, and the community is essential to ensure adequate support in terms of technological infrastructure and other resources. In this case, the government must provide adequate facilities and training so that technology can be utilized optimally in education. Furthermore, evaluation and adjustment of learning strategies need to be carried out periodically to address emerging challenges and ensure that the strategies implemented remain relevant and effective in facing the dynamics of education in the 21st century.

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