

21st-Century Education Innovations: Solutions to Solving Problems Learning in Indonesia

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ABSTRACT

The significant influence of information and communication technology in various aspects of human life marks the 21st century. That is why the 21st century is also known as the information age. It means that everyone can learn anything, anytime, anywhere, with anyone in any way. Learning is more open, flexible, and distributed. Building students' 21st-century skills is a challenge. The old learning paradigm can no longer be maintained. Starting with simple things, the modern education paradigm based on student-centered and constructive learning should be implemented immediately. The conventional learning paradigm has changed. Teacher-centered learning turns into student-centered learning or two-way learning. This paper, therefore, aims to reveal how 21st-century education innovation should be created to improve the quality of Indonesian education (teachers and students) in the era of the industrial revolution. 4.0. The method used in this study uses a library research method or approach. The author concludes that teachers in the development of 21st-century education now have more severe challenges, and their tasks are more complex. The role of the teacher is significant in managing the learning process and facing these challenges. Therefore, teachers must be able to think critically, have a social responsibility, build networks, time discipline and rules, and have the capability and skills in the 21st century.

Keywords: 21st-Century Education, 21st-Century Teaching Method, Innovative Learning

INTRODUCTION

During the last decade, education in Indonesia is still experiencing the same thing, namely focusing on teaching three skills; reading, writing, and arithmetic, and some simple subjects such as social and cultural studies. In this traditional approach, most students feel bored and passive because the teaching and learning process is dominated by repetition in teaching content. This memorization model is based on a teacher-centered focus which requires students to memorize large amounts of information to expand their knowledge. Teachers then assess students' knowledge using tests and quizzes at the end of the unit or year to identify students' learning levels. This learning is far from practical because it is ancient or feudalistic and does not respect freedom of thought. So, it is not surprising that it is surprising that the world ranking agency assesses that education in Indonesia is still underdeveloped.

The Program for International Student Assessment (PISA) research results stated that Indonesia scored 371 for the reading category, 379 for mathematics, and 396 for science. Indonesia lags behind Malaysia, which is in 56th place, with a score of 415 for reading, 440 for math, and 438 for science (vivanews.com, 5 December 2019). The results of this PISA assessment are valuable input for evaluating and improving the quality of education in Indonesia, which will be the focus of the government for the next five years, namely emphasizing the importance of competence to improve quality to face the challenges of the 21st-century (edukota.com, 15 January 2020). The trend of the times has changed towards a more digital direction. Indonesia must immediately clean up and meet the 4.0 education target to create intelligent and well-mannered humans.

According to the Partnership for [21st-century Learning \(2011\)](#) 21st-century innovative learning framework, education in the twenty-first century requires students to have a variety of complex knowledge accompanied by various skills, including higher-order thinking skills, skills in the workplace, and skills in using information, media, and technology.

Students' achievement of these skills depends on several efforts so that the human resources produced in education can compete in the national and international job market. Therefore, the government must continuously follow world education development and prepare specific strategies for preparing human resources to increase the nation's competitiveness.

21ST-CENTURY EDUCATION

21st-century education is very complex in terms of various disciplines and skills. Students are required to be proficient and able to solve various problems in learning. According to [Ontario \(2016\)](#), 21st-century competence is a total aid and achievement covering knowledge, skills, and other aspects. Over time, there have been changes in competencies that have existed throughout history, such as collaboration and communication. Furthermore, [Ontarion \(2016\)](#) explains the importance of cooperation and collaboration in 21st-century education. Previously, collaboration and collaboration activities with colleagues and personally but in a broad scope were not in demand, even though aspects of collaboration and collaboration were the keys that must be applied if you wanted a positive impact from significant results. Therefore, collaboration should be an essential aspect that must be included in 21st-century competencies.

In addition to the collaboration aspect, two other aspects are no less essential to be discussed in this article as supporters of success in 21st-century education. The two aspects are: (1) a mature curriculum design and (2) instructional design. In curriculum design, what is expected in 21st-century education is maximum achievement in authentic learning, where students are effectively involved in the learning environment and develop 21st-century skills such as critical thinking, problem-solving, and collaboration. In this way, [Lombardi \(2007\)](#) believes that students who have been dispersed with well-integrated knowledge and skills will help achieve success in their future careers. Therefore, curricula in the 21st century should focus on building knowledge and encouraging students to produce information that has value or meaning

to develop new skills. [Lombardi \(2017\)](#) further said that preparing a curriculum connected to the real world can support student participation, motivation, and understanding of academic subjects and prepare them for adult life. This is reinforced by [\(CCSSI 2010, p. 6\)](#), that the standards have been designed so that the abilities of our youth will be solid and relevant to real-world needs. They will be successful in college and their careers and compete in the global economy. Equally important, multiliteracy can enable students to make decisions to prepare themselves for challenges in the global community and allow them to be successful in the workplace [\(Wiggins & McTighe, 2005\)](#).

In terms of the curriculum, [Ellis \(2004\)](#) explained that students are expected to gain knowledge about their world as the foundation of life to survive in adulthood if the curriculum is centered on knowledge. Researchers, including Herington and [Kevin \(2007\)](#), argue that the thinking curriculum is a curriculum that provides an in-depth understanding of the subject and the ability to apply that understanding to complex real-world problems that students will face as adults. As a result, teachers have to apply different strategies and methods to teach these skills because there is no specific strategy or model to achieve this goal.

Meanwhile, instruction design as an aspect of 21st-century education plays a significant role in curriculum planning. Teachers and lecturers have a significant role in helping students develop skills in 21st-century education by applying methods to improve students' abilities. One of them is implementing innovative strategies and modern learning technologies that help integrate cognitive and social skills with content knowledge and increase student participation in learning environments to promote these future skills. Many strategies enhance the learning content. One such approach is problem-based learning. In this model, students can analyze and discuss various current problems and topics in the real world. [Joyce et al. \(2009\)](#) said problem-based learning could increase critical thinking power. [Drew \(2013\)](#) found a correlation between problem-based learning and critical thinking skills.

Meanwhile, [Trilling and Fadel \(2009\)](#) say critical thinking, analyzing problems, interpreting results, evaluating, summarizing, and synthesizing information. This approach allows students to learn through creative and breakthrough thinking barriers to achieve unique 21st-century learning. When teachers apply this strategy, they support students' capacities for critical thinking, independent learning and collaboration, and social interaction.

INNOVATIVE LEARNING

In a very sophisticated era where communication and information technology dominate all human lifelines today, [Robinson et al. \(2008\)](#) emphasize that learning today must utilize learning models and strategies that are fully oriented to 'facilitate, create, and grow. Willingness to learn from students. Thus, teachers, lecturers, developers, and observers of educators or learners feel compelled and motivated to carry out pedagogical engineering to produce innovative learning strategies.

Many studies have been published that demonstrate the effectiveness of innovative learning, such as mobile learning models (Ulfa, 2013; Chu, 2014), flipped classroom strategies (Hwang & Chen, 2019), blended learning models (Lee & Lai, 2017), multimedia student strategy (Enfield, 2013; Rusli et al., 2014), social learning network-based universal design for learning (Firmansyah et al., 2018), and gamification-based individual learning assisted with mobile augmented.

The strategies or learning models above should be done anywhere and anytime because of the conditions in which information and knowledge can be found or obtained in various sources, situations, and places (Milcevic et al., 2017; Pletka, 2007). Learning strategies are not only related to the method of delivering knowledge (delivery of knowledge) but are also a series of activities that include the use of methods and the utilization of various resources, such as media and learning resources, which are structured to achieve learning objectives (Fuad et al., 2016; Marzoan et al., 2016; Reni et al., 2017). In short, it can be said that the learning strategy is an effort to create a learning environment to facilitate learning and foster students' motivation, willingness, and learning habits.

INNOVATIVE LEARNING FRAMEWORK FOR THE TWENTY-FIRST CENTURY

Innovative learning in the 21st century refers to the framework for 21st-century learning with components such as (1) learning environment, (2) professional ability development, (3) curriculum and instruction, and (4) standards and assessment, becoming the entry gate for the era of globalization in order to be able to compete in the world of work. *Core subjects and 21st-century themes as academic foundations in the 21st-century and components of life and career skills, learning and innovation skills, and information, media, and technology skills as students' learning products.* In addition, the government recommends integrating core academic knowledge, critical thinking, and social skills in Indonesia (teaching and learning) to help students master the multi-dimensional skills needed in the 21st century. These skills can help students succeed in their future careers by supporting the 21st-century 'improve outcomes' learning system. Therefore, the P21 framework and the Common Core Country Standards support each other to achieve the future skills students need (see Figure 1). By integrating cognitive learning and skills into the curriculum, students can understand the subject and try to solve complex problems (Wagner et al., 2006).

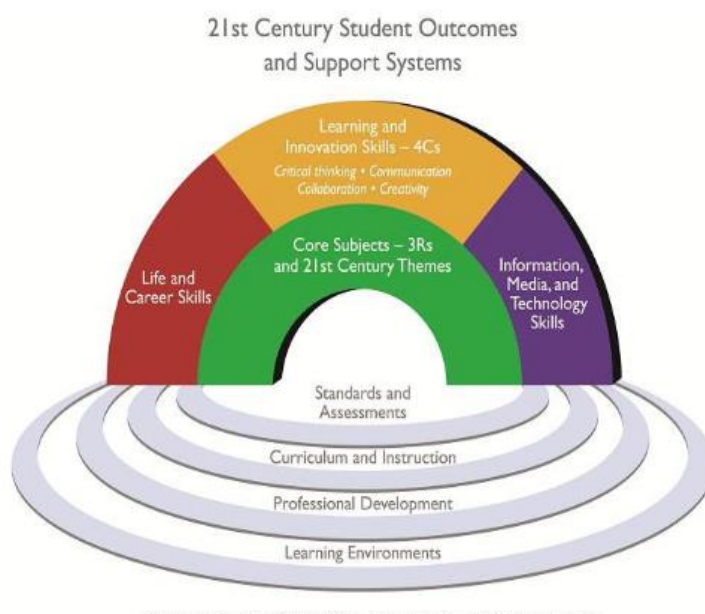


Figure 1. 21st-Century Learning Framework
([Partnership for 21st-Century Learning, 2011](#))

Partnerships for 21st-century skills set educational standards for the next generation to present the right strategies to implement them. The 21st-century standards include: (1) focusing on 21st-century skills, content knowledge, and expertise; (2) building understanding across and between core 21st-century subjects and interdisciplinary themes; (3) emphasizing deeper understanding over superficial knowledge; (4) engaging students with real-world data, tools, and experts they will encounter in college, at work, and in life; and (5) allowing for multiple mastery steps.

The framework as listed in Figure 1 above shows that knowledge (through core subjects) alone is not enough, and students must be equipped with the following skills: (1) critical thinking and problem solving, creativity and innovation, communication, and collaboration; (2) life and career skills such as flexibility and adaptability, initiative and independence, social and cultural skills, productive and accountable, leadership and responsibility; and (3) information skills, media, and technology, which means students must be information, media, and technology literate.

Referring to the 21st-century innovative learning framework, as shown in Figure 1 above, the government must continue to improve and develop the quality of education so that the human resources produced can compete in the era of globalization. The government has made various efforts to improve the quality of education, both primary education, secondary education, and higher education, to improve the quality and competitiveness of human resources in entering the development of the globalization era. At present, efforts are being made that are closely related to the framework for 21st-century learning, namely: (1) adjusting national education standards by referring to the achievement of educational standards at the international level, (2) reviewing and revising the curriculum regularly and continuously, (3) developing professional abilities

for human resources, and (4) developing a learning environment. Explicitly, these efforts are explained as follows:

This radical and profound change in various aspects of people's lives requires careful attention by actors and decision-makers in the government. Misjudging, formulating, and developing policies will negatively affect a country's growth rate.

Humans are the most critical factor in all the components and aspects of growth because they are the main actors in various processes and activities of life. Therefore, various countries are trying to define the human characteristics of the 21st century in question. Based on the "21st-century Partnership Learning Framework", there are several competencies and skills that must be possessed by 21st-century HR, namely: (1) Critical-Thinking and Problem-Solving Skills, (2) Communication and Collaboration Skills, (3) Critical-Thinking and Problem-Solving Skills, (4) Communication and Collaboration Skills, (5) Creativity and Innovation Skills, (6) information and communication technology literacy, (7) contextual learning skills, and (8) Information and Media Literacy Skills.

In addition, several character and behavior-based aspects that humans need in the 21st century are also defined, namely: (1) leadership-leadership spirit, (2) personal responsibility – responsible attitude, (3) ethics, (4) people Skills– having expertise, (5) adaptability– being able to adapt, (6) self-direction– having clear directions and principles, (7) accountability– based on a clear path, (8) social responsibility– having responsibility for the environment, and (9) personal productivity– able to improve quality.

21ST-CENTURY LEARNING METHODS

21st-century education is closely related to the achievement of cooperative learning pedagogy. This method of dividing two groups of students with different and diverse abilities strongly affects learning and gives different results. According to [Knowlton \(2003\)](#), the diversity of capable and skilled students will encourage them to work creatively wherever they are. In line with Knowlton, [Trilling, and Fadel \(2009\)](#) explain that many positive aspects will increase if students learn with group methods. The aspects that emerge are mutual respect in the team, predicting the teamwork required to complete joint actions, and the desire to unite in working for a common goal. In addition, collaborative learning positively impacts students' abilities, such as increasing their motivation and performance and developing social interactions.

Another strategy that is no less important and very good in supporting the success of 21st-century learning is utilizing and using many technological tools in the form of different skills, for example, problem-solving, critical thinking, collaborative learning, and the learning environment. For example, portfolios, WebQuests, Guizzes, Wikis, Google sites, Digital Storytelling, e-Portfolios, SoftChalk LessonBuilder, blogs, MOOCs, etc. ([Jacobsen, 2001](#)). With the technological tools (multimedia) offered, students can apply cooperative and collaborative learning strategies to improve and develop their critical thinking. This is supported by several previous research results, which say that

students who use multimedia in their learning have more sophisticated thinking than those who are only exposed to traditional teaching methods (Kanuka et al., 2007).

Currently, almost all students in Indonesia are literate in technological literacy. Technology as a sophisticated support tool allows students to access information from worldwide, anywhere, and anytime. In this case, teachers must provide students with opportunities to study, observe, research, and obtain information to develop and apply different skills. Technology gives students more practice in reading and writing and on line literacy to meet their future needs. Drew (2013) says that to become broad-minded students, "Students need to be prepared as skilled and strategic readers, writers, and communicators in an online environment." At the same time, Jacobsen (2001) argues that understanding and developing creativity and innovation skills will be obtained by students who are given many opportunities to utilize technological tools.

21st-century instructors allow students to expand their knowledge, experience, and skills by building ways to understand the real world. Multimedia tools are the best way to improve student performance and motivation to learn by encouraging discussion, collaboration, problem-solving, and innovation while promoting cognitive processes and building knowledge. 21st-century: critical thinking and problem-solving; collaboration across networks and leading by influence; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analyzing information; curiosity and imagination. This approach can help teachers improve current lessons and facilitate discussing presented topics using technological tools, making abstract or conceptual content more understandable (Mueller, 2006).

CONCLUSION

21st-century education is happening right now. Innovative 21st-century education produces highly competitive Indonesian human resources coupled with an education that emphasizes mastery of core subjects and 21st-century skills development. These skills help students pursue higher education and enter the world of work. In Indonesia, several strategies are used to achieve the 21st-century skills needed for problem-solving, critical thinking, collaborative learning, integration environments, and digital tools in teaching (Tyack, 1974). The curriculum and teaching of the twenty-first century take an integrative approach to achieving student success. Implementing a 21st-century curriculum and instruction in schools is essential to prepare students to face today's complex challenges.

SUGGESTION

Future research should consider this implication for teacher preparation in an appropriate way to inculcate 21st-century skills in lessons and integrate multimedia tools. In addition, future research should continue to investigate the effects of 21st-century curriculum and instruction on students' cognitive, academic, and social capacities and measure these effects across different grade levels and fields of study. Another thing that needs to be emphasized is the future skills for the 21st century, which are needed to prepare active citizens who can face the challenges of a global

society, be innovative in solving complex problems, and use the power of technology to change the world for the better.

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