

21st Century Learning: Strategies and Competencies

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Abstract—Education is expected to be future-oriented and answer the challenges of the times. The challenges of 21st century education is certainly different from the previous century. Stakeholders in this case schools, teachers, parents, and graduate users are very interested in the competencies and skills that students who graduate from schooling institutions must possess today. Various demands arise to answer the global demands of 21st century education, teachers who understand the various competencies and skills that must be developed for students in the 21st century, teachers who understand and are able to apply 21st century learning models and strategies, as well as a child-friendly environment for learning in the 21st century. Responding to the challenges of education in the 21st century requires the cooperation of all parties, including the government, schools, graduate users, and parents.

Keywords—21st century education, 21st century skills, 21st century learning model

I. INTRODUCTION

Indonesia is facing a period in which it will experience a demographic bonus. The number of productive age in Indonesia will increase. Indonesia is currently entering the stage of changing the age structure of the population, namely having a population of productive age, or working age that is greater than the population of non-productive age [1]. The demographic bonus is basically inseparable from the millennial generation. The percentage of the population of productive age reaches about 67.02 percent of the total population. This shows that the role of the millennial generation in shaping the structure of the productive age population is quite high, because around 50.36 percent of the productive age population is basically the millennial generation. It is not wrong if the millennial generation is called the determinant of Indonesia's future [2]. The hope of the Indonesian people for the future lies on the shoulders of the millennial generation, which now dominates the productive group.

To welcome this demographic bonus explosion, of course, it requires the Indonesian people to be prepared to make the best use of it so that it can become a gift that drives the nation's progress. This explosion of productive age can encourage the progress of the nation if they are educated, skilled, healthy and

have jobs [3]. However, if this is not used properly, it will be disastrous. Where many productive age populations are not absorbed by the available jobs in an economy, it will become an economic burden because the productive age population who has no income will continue to be a burden for the working population and will trigger a high unemployment rate [4]. We need to think together to find a solution so that the children of this millennial generation will later become extraordinary wealth driving the nation's progress. In addition, the feared catastrophe must be addressed with preparedness to ward off it by preparing a quality and productive generation that encourages national development.

One of the efforts to make Indonesia's young generation productive and an asset for nation building is through the provision of education that is in accordance with the times. Young people of this millennial generation live in the 21st century with the trend of globalization which is marked by a world that is getting narrower without barriers, greater dependence between nations, increasingly fierce competition, dense information, strong communication, and openness. Advancing the world of education in Indonesia is not an easy thing, like turning the palm of the hand. There are still many educational problems in Indonesia today, including the quality and competitiveness of Indonesian education is very low and uneven, one of which can be seen from the parameters of the PISA (Program for International Student Assessment) test results. The level of Indonesian children in reading, mathematics and science is below the ability of children from neighboring countries such as Singapore, Malaysia, Vietnam, and Thailand. Thus, it is important to carry out up-to-date education, according to the context of the times. Indonesian children must receive the right education, one of which is non-skilled education in the 21st century. Who are the parties at the forefront, none other than the educators, the teachers. Teachers are at the forefront of this change, and they must have the knowledge, skills, and support to become effective 21st century teachers [5].

II. RESEARCH METHODS

This study uses a qualitative approach with a literature study method. Literature study is used to see the discussion of

21st century learning. This research data is in the form of library data from various sources with reading and writing techniques so that the data is processed to become research.

In the process of carrying out the research, the division of tasks is arranged in a professional manner between the chairman and members. The chairperson is responsible for preparing all research needs, coordinating the team in conducting research, compiling the design and results of research outputs (adjusted to the division of tasks on the activity schedule), compiling reports (adjusting the division of tasks on the activity schedule). Meanwhile, members drafted interviews, collected data, reduced, and compiled reports.

The indicators of achievement of this study resulted in an understanding of 21st century learning. So that this understanding can be used as a reference in the development of 21st century education.

III. FINDING RESEARCH

A. 21st Century Skills

The 21st century is characterized by the evolution of technology and ICT, globalization, and the need for innovation, consequently highlighting the need for students to develop relevant skills and competencies [6]. This certainly affects the order of education and the demands of the world of education. Education is not just about making students who receive it have knowledge, but more than that learning in school institutions as a process of acquiring knowledge, skills, and competencies [7]. To increase success in adulthood, today's high school and college graduates must be equipped with academic skills and life and career skills. Therefore, it is important for schools and community-based youth service organizations to consider students' mastery of noncognitive skills, especially as this area is an emerging priority in education reform and in the global marketplace [8]. 21st Century Education focuses more on how students can combine the content of knowledge, specific skills, expertise, and literacy needed to succeed in work and life [9].

The 21st century skills that are indispensable for graduates to excel and compete in the 21st century have been identified by The Partnership for 21st Century Skills. P21 (Partnership for 21st Century Learning) has developed a learning framework in the 21st Century which requires students to have skills, knowledge, and abilities in the fields of technology, media, and information, learning and innovation skills as well as life and career skills. This framework also describes the skills, knowledge and expertise that must be mastered so that students can be successful in life and work. These skills can improve marketability, employability, and readiness to become good citizens [10]. Basically 21st Century skills are more than just technological literacy skills and include the ability to think critically, solve problems, communicate, and be flexible in teamwork. Moreover, these skills ensure students thrive in global competitiveness [11]. Thus, to survive we are required to be able to adapt and adapt in a society that is developing very quickly in this era of globalization, so we need to learn new things that are appropriate to the context of needs.

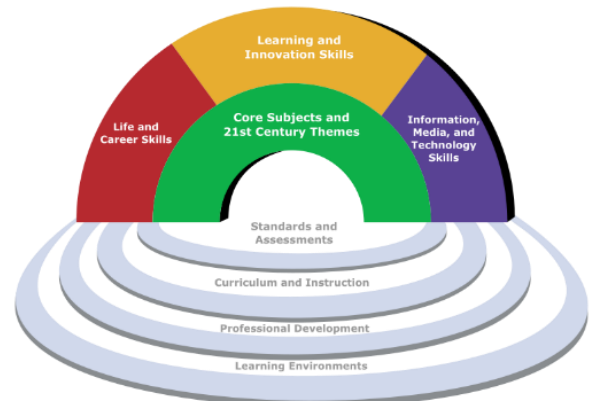


Fig. 1. P21 framework for 21st century learning.

The National Education Standards Agency [12] explains the 21st century learning framework, (a) Critical-Thinking and Problem-Solving Skills, able to think critically, laterally, and systematically, especially in the context of problem solving; (b) Communication and Collaboration Skills, able to communicate and collaborate effectively with various parties; (c) Critical-Thinking and Problem-Solving Skills, able to think critically, laterally, and systemically, especially in the context of problem solving; (d) Communication and Collaboration Skills, able to communicate and collaborate effectively with various parties; (e) Creativity and Innovation Skills, able to develop their creativity to produce various innovative breakthroughs; (f) Information and Communications Technology Literacy, able to utilize information and communication technology to improve performance and daily activities; (g) Contextual Learning Skills, able to carry out contextual independent learning activities as part of personal development, and (h) Information and media literacy skills, able to understand and use various communication media to convey various ideas and carry out collaborative activities and interactions with various parties.

Core skills that must be possessed in the 21st Century, namely Critical Thinking Skills; (2) Problem Solving Ability; (3) Communication and Collaboration; (4) Creativity and Innovation; (5) Information, Communication, and Technology Media Literacy. All these skills are a package of skills to face the challenges of globalization. Ability in all these aspects is an effort not to be eroded in the development of a globalized world, on the contrary as an attitude of preparedness to face the challenges of the times. Next, we will discuss the core skills that teachers must possess in the 21st Century.

Critical Thinking Skills. One of the important skills in the 21st century is critical thinking skills. Critical thinking skills are logical, reflective, productive, and systematic thinking skills that arise in making the best judgments and decisions. Critical thinking skills are useful in improving analytical skills, creativity, the ability to utilize ideas or information, and information seeking and self-reflection skills [13]. the ability to analyze, interpret, evaluate, summarize, and put all this information together and apply the results to solve pressing problems [5].

Critical thinking does not just appear. It needs to be trained and developed. The following. The ability to think critically

has certain characteristics. namely: (1) Looking for a clear statement of each statement; (2) Looking for reasons; (3) Trying to know the information well; (4) Use sources that have credibility and mention them; (5) Paying attention to the overall situation and condition; (6) Try to stay relevant to the main idea; (7) Bearing in mind the original and fundamental interests; (8) Looking for alternatives; (9) Be open and think; (10) Take a position when there is sufficient evidence to do something; (11) Seek explanations as much as possible if possible; (12) Be systematic and orderly with parts of the whole problem; and (13) Be sensitive to the level of knowledge and expertise of others (14).

1) *Problem solving skills*: Problem solving skills include other skills such as identification and the ability to search, select, evaluate, organize, and consider alternatives and interpret information. Someone with problem solving skills, they can solve unusual types of problems in conventional and innovative ways. In addition, they can identify and ask important questions that clarify different points of view and lead to better solutions [5].

2) *Communication and collaboration*: In the world of education, it is very important to pay attention to the principles of good communication, including correct speech, fluent reading, and clear writing, as well as mastery of digital tools. In addition, collaboration skills are needed to promote shared learning. The indicators of the ability to communicate and collaborate are described by Trilling and Fadel [5] as follows.

Communication skills are clearly characterized by, First, Articulate thoughts and ideas effectively using spoken, written, and nonverbal communication skills in various forms and contexts. Second, listen effectively to decipher meaning, including knowledge, values, attitudes, and intentions. Third, use communication for various purposes (e.g., to inform, instruct, motivate, and convince). Fourth, utilizing various media and technologies, and knowing how to assess their effectiveness a priori and assess their impact. Fifth, communicate effectively in diverse (including multilingual) environments.

Collaboration is a process of co-creation, two or more individuals with related skills that complement each other to create a shared experience of understanding that was not previously owned or possessed by others [15]. The skill of collaborating with others is characterized by the following characteristics: First, demonstrating the ability to work effectively and respectfully with diverse teams. Second, exercise flexibility and willingness to assist in making the necessary compromises to achieve common goals. Third, assume shared responsibility for collaborative work, and value the individual contributions made by each team member.

3) *Creativity and innovation*: One day, President Barack Obama said, "I called on our state governors and head of state education to develop standards and assessments that measure not only whether students can fill the bubble on a test, but whether they have 21st century skills such as problem solving and critical thinking, and entrepreneurship and creativity".

Today global competition is a challenge for all of us. A creative and unyielding attitude is one of the capitals of one's

success in life in a globalized world. Creativity is an ability possessed by a person in creating a work that is obtained from various kinds of ideas, ideas, and the imagination of the person himself [16]. Creativity is characterized by several characteristics, namely flexibility, fluency, skill (smartly), and intelligence (intelligence). Someone who is creative as stated by Campbell [17], namely those who can respond and provide solutions to the problems faced, intelligent and full of motivation, and able to produce or create something new. Creative skills apart from being able to come up with new ideas, work out of line and analyze, are also characterized by distinctive characteristics, namely having curiosity and an entrepreneurial spirit; can think out of the box, know creativity techniques, dare to take risks and view failure or mistakes as learning opportunities [18]. The essence of creativity is being able to find novelty and being able to overcome problems brilliantly [19]. Basically, every child is born as a creative child. However, if given a stimulus and treatments, then the creativity of children will develop [20]. Thus, a creative attitude as a capital of resilience in the direction of success in the era of globalization already exists in children, it's just that there needs to be development through families, schools and an environment that is friendly to children's creativity.

In addition to the idea of developing creativity, the next step is the application of a creative attitude in life together. The steps that can be taken include developing, implementing, and communicating these new ideas to the audience effectively. Creative attitude in living together can also be done by being open and responsive to new and diverse perspectives; incorporate input and feedback. As a form of ethics in creativity, a person is required to show originality and creativity in working and adopting new ideas. It is important to understand that the road to failure is not easy, we need to see failure as an opportunity to learn and understand creativity and innovation is a long-term cyclical process of small successes and often learn from mistakes.

The life of the 21st Century not only requires us to have the ability to be creative, but also requires us to have the ability to innovate. Innovation is an idea, practical things, methods, ways, and man-made items that are observed or perceived as new for a person or group of people. Something new can be the result of a discovery or invention that is used to achieve certain goals and to solve certain problems [21]. Today the world demands better production processes, more perfect services, creative knowledge development processes, all of which are for the welfare of a better life in the 21st Century era. It is not surprising then that the ability to be creative and innovative is at the top level of 21st Century skills. The Innovation Era gave birth to work that is highly appreciated, because it encourages the birth of new ways to solve problems, create new technologies, efficiencies, discover new knowledge or develop them and more importantly create entirely new industries.

Creativity and innovation focus on the pursuit of discovery and discovery. With the development of creativity, students in schools are required to use various idea creation techniques including through brainstorming, creating new, new, and valuable ideas, as well as elaborating, improving, analyzing, and evaluating their own ideas to improve and maximize creative efforts. Creative and innovative attitudes strongly

support the progress of the nation considering that it can be the finding of effective solutions to the nation's problems. Creativity and innovation have been highlighted as important skills for the 21st century, especially when we consider that they can enhance human potential by bringing out positive aspects of the individual [22]. Thus, the development of the ability to be creative and innovative becomes a very important skill to produce inventions to provide solutions to problems in life and support the development of the nation.

4) *Information, communication, and technology media literacy*: Mastery of information media, communication and technology in this 21st century era is important in facing challenges and global competition. The world wants something better, a better quality of life, a fast and sustainable development and a qualified and productive resource capacity. Various new challenges arise, one of which is in the mastery of information, communication and technology media. Phenomena like this certainly cannot be ignored in the current vortex of global competition. Various challenges that arise include improving the quality of life, equitable development, and the ability to develop human resources. One of the answers to these demands is to carry out information, communication and technology literacy. The desired skills from information literacy, communication and technology as stated by Trilling and Fadel (5) are first, information literacy gives birth to students who are able to access information effectively (source of information) and efficiently (time); evaluate the information to be used critically and competently; use and manage information accurately and effectively to solve problems. Second, media literacy is expected that students are able to choose and develop the media used to communicate. Third, ICT literacy with the aim that students are able to analyze information media; and create appropriate media for communication.

B. Teachers in 21st Century Learning

The success of 21st century learning cannot be separated from the role of an educator or teacher. Teachers are the driving force of 21st Century skills-based learning. They need academic and applied knowledge to link knowledge and skills, be creative and adaptive. Teachers play an important role in helping students acquire 21st Century skills as an essential component of today's education system [23]. Even today teachers play an important role in helping students develop 21st century skills by applying methods that enhance students' abilities. They should use innovative strategies and modern learning technologies that help integrate cognitive and social skills with content knowledge and increase student participation in the learning environment to promote these future skills [24]. Teachers will become models and facilitators for their students, so it is important to transform all these aspects into valuable skills in carrying out their duties as educators.

The era of the 21st century with the development of technology in the world of education gave birth to digitalization so that gaining knowledge is not only in a walled classroom. The teacher's role is no longer an "infomediary"

because the student can already directly access the sources of knowledge that had to be disseminated or distributed by the teacher/lecturer in the classroom. The teacher will function more as a facilitator, trainer ("coach"), and a companion for students who are going through the learning process. Even at the extreme, it is undeniable that in several contexts, teachers and students together learn and acquire knowledge through the interactions that exist between them when discussing a particular material. In addition, the implementation of teaching and learning activities must also be extended beyond the boundaries of the classroom, by increasing student interaction with the surrounding environment in various methodological forms [12].

The ability of teachers is very important to support the successful application of 21st Century skills [25]. These various skills are contained in the 21st Century teacher profile, namely first, knowledge, namely the intellectual abilities possessed by an educator which includes mastery of subject matter, knowledge of teaching methods, knowledge of learning and individual behavior, knowledge of guidance and counseling, knowledge of about society and general knowledge. The two performance criteria are closely related to the pedagogical abilities (skills and teaching behavior) of educators, namely the ability of educators which includes teaching skills, guiding, assessing, using teaching aids, associating, and communicating with students and skills in preparing teaching preparation or teaching planning. Third, product criteria are related to how the process of measuring educators about student learning outcomes in 21st century learning [26]. As an ability in the context of the digital era, the ability of teachers is also inseparable from competencies related to technology and communication in the 21st century, namely the competence of digital age literacy, inventive thinking, effective communication, and high productivity [27].

It is important to become a shared awareness that the 21st Century Era brings a paradigm shift in ongoing learning. The achievement of education through this new paradigm requires a courageous attitude to change and be carried out comprehensively. The new paradigms of 21st Century Education are as follows [12].

1) *Initially teacher-centered became student-centered*: Students become active learners who interact, argue, debate, and collaborate. The role of the teacher is no longer merely to teach, but to become a facilitator for the students.

2) *Learning from one direction to interactive*: Teachers are required to create interesting and fun classes with appropriate approaches and methods.

3) *Starting from isolation to the network environment*: Learning is no longer only based on teachers and books in the classroom, now it can be obtained through the internet.

4) *From passive to active-investigating*: In this era, students are encouraged to have a high curiosity, solve problems. Teachers train students to learn higher order thinking (HOT).

5) *From the abstract to the real world context*: Teachers must be able to provide examples that are appropriate to the

context of everyday life and relevant to the material being taught.

6) *From personal learning to team-based learning by prioritizing collaboration between individuals.*

7) *From broad to specific, by examining only material relevant to the life of the given student.*

8) *From one aspect of stimulation to comprehensive stimulation of all aspects of child development (cognitive, affective, and psychomotor).*

9) *From single media to multimedia, both conventional and modern.*

10) *From one-way interaction shifts to cooperative, dialogical between teachers and students.*

11) *From the principle of equality to a unique context, every student has the right to get content according to their interests or unique potential.*

12) *From individual awareness to togetherness and diversity, by highlighting the diversity of initiatives that arise from each individual.*

13) *From one science shifts to knowledge of multiple disciplines.*

14) *Starting from centralized control on the teacher to autonomy and trust in students to be responsible for their respective work and activities.*

15) *From factual to critical thinking in order to develop creative and critical thinking to solve problems.*

16) *From the delivery of knowledge to the exchange of knowledge, considering that in the 21st century:* In this global and modern era, what happens in the classroom is the exchange of knowledge between teachers and students as well as between students and each other.

Times have changed, now in the 21st Century Era the challenges of the world of education are increasingly complex. Education has changed paradigms, from conventional paradigms to new paradigms in the multidisciplinary era, collaboration, information technology with discovery orientation for the welfare of life. Thus, all parties with an interest in the world of education (Shareholders) must collaborate to create education as a space for actualization, creation, innovation, multi-disciplinary and awareness to build shared prosperity.

C. Designing a 21st Century Learning Environment

Setting up a conducive learning environment for successful learning for students is not an easy matter. Setting up an environment that creates meaningful, active, and fun learning requires seriousness and hard work. The teaching-learning environment should be a living environment where students acquire advanced professional skills, where they learn how to learn, play, work independently, live in community, collaborate with others, and think together [28]. Given that the challenges of 21st Century Education are extraordinarily complex, apart from unique students, their changing needs are extraordinary. Therefore, teachers must have adequate initiative, knowledge, and competence to prepare an effective learning environment.

The 21st Century learning environment is about the design, timing, tools, community, and policies that support 21st century learning and teaching [29]. The 21st Century learning environment is set up for students to have the opportunity to practice 21st century life and career skills. In fact, students' learning environments are positively related to their perceptions of their own 21st century skills. This shows that more attention is needed to understand the appropriate classroom environment (8). A supportive environment should also be an environment that can foster curiosity, patience, openness to fresh ideas, a high level of trust, and learning from mistakes and failures [30].

The teaching-learning environment should be a living environment where students acquire advanced professional skills, where they learn how to learn, play, work independently, live in community, collaborate with others, and think together.

Every society, wherever it is located, must have its own characteristics as a distinctive norm in the socio-cultural field that is different from other societies. The norms contained in the community must be followed by its citizens and these norms influence the formation of the personality of its citizens in acting and behaving. The community is involved in discussing issues of children's education, both academic and non-academic. And participate in the decision-making process in education development plans [20].

IV. CONCLUSION

The 21st century is characterized by the evolution of technology and ICT, globalization, and the need for innovation, consequently highlighting the need for students to develop relevant skills and competencies. These conditions must be supported by the competence of teachers in conducting learning in the 21st century, as well as a child-friendly environment for learning in the 21st century. To answer the challenges of education in the 21st century requires the cooperation of all parties, including the government, schools, graduate users, and parents.

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