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The challenges of Indonesian Middle Education in The Era of Society 5.0 (Case Study in North Sumatera Province)

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Abstract. This study aimed to find out the challenges of Indonesian middle education in the society 5.0 era with the subject is the middle school in North Sumatera. The Methode of this research is literature study with qualitative approach and describe existing phenomena by collecting data from books, journals and scientific works of related and reliable research results. The analysis technique consists of three stages of data reduction, data collection and conclusions. The result statement of this study found that there are still many things that must be prepared by the middle education, then the challenges are done by familiarizing analytical, critical, and creative ways so that Society 5.0 era concepts such as the Internet of things (IoT), Artificial Intelligence (AI), Robotics, and Distributed Ledger Technology (Blockchain) can be applied. So the implication to the Indonesia's SDG's in the education's can be achieved.

Keywords: society 5.0, education, challenges, SDG's, middle education

1 Introduction

Education has become a trendy topic in Indonesia today. Discussion is about how students graduate from school and how to properly implement the learning process and educate students as the next generation of the nation. Pedagogical problems are also very complex, one of which is the quality of human resources (HR) perceived as less qualified. This lack of perceived quality is the beginning of new problems such as a less than optimal learning planning process.

Based on the Strategic Plan of the Institute of Education Quality of Education In North Sumatra Province 2020 - 2024, revealed that the average index of achievement of the National System of Education (SNP) of junior high school education units in North Sumatra Province in 2019 was in the category "towards level 4" with a range of 5.1 in 2018 and 5.35 in 2019. This value indicates that there is a change taking place.

Although there is an increase in the achievement of 8 quality standards in the education unit, Indonesian education still has many problems that need to be solved and developed. When it comes to targets, it's indeed based on international surveys. At the same time, the Programme for International Student Assessment (PISA) in 2018, published in March 2019, surveyed student ability that placed Indonesian education 72nd out of 77 countries. This data reveals that the power of Indonesian students is still meager.

When talking about the quality of education, Indonesia applies 8 standards that must be improved to achieve quality education, including: (1) content standards, (2) process standards, (3) graduate competency standards, (4) standards of educators and education personnel, (5) standards of facilities and infrastructure, (6) management standards, (7) financing standards, and (8) assessment standards. These 8 standards will be the guidelines for educational

institutions in improving the quality of Indonesian education, especially in North Sumatra Province, where researchers conduct field observations. Improving the quality of education must also be accompanied by rapid technological and information advancements. In the 21st century, the world has even begun to enter the era of society 5.0.

Society 5.0, one of the terms that promote and describe this digital society, brings this digital reality to life by "suggesting the potential of individual technical relationships to promote quality improvements. "Shake it to some extent. Life of all people through a super-smart society" [1]. So, Society 5.0 has the concept of big data technology (data in large quantities) put together by the Internet of Things (IoT) and changed by Artificial Intelligence (AI) and robotics so as to improve people's quality of life so that life becomes better. Society 5.0 impacts every aspect of life, from health, urban planning, transportation, agriculture, industry, and education. Quality education is defined as education that produces products that meet current needs [2]. Therefore, the development of education is not limited to trying to complete what already exists and improve what has been achieved, but also not limited to finding opportunities (improvement by people), but more importantly, trying to produce something different based on the times.

Society 5.0 targets an era where the focus of society is on humans who balance economic progress by integrating the virtual world and the real world through systems so as to solve social problems. This idea was born in response to the Industrial Revolution 4.0 as an important technological development change, but society plays a very important role in being able to achieve the era of society 5.0. The concepts of Industrial Revolution 4.0 and Society 5.0 are actually said to be pretty much the same. The difference is that Industrial Revolution 4.0 uses artificial intelligence, and Society 5.0 focuses on the human element. The concept of "Society 5.0" is a new innovation from "Society 1.0" to "Society 4.0" in the history of human civilization.

The Concept of Society 5.0 was created to support the 17 Sustainable Development Goals (SDGs) of the United Nations by 2030. To achieve these 17 goals, people must be able to take advantage of the sophistication of the digital world to change their lives and find environmental and social solutions to the problems around them. One of the goals of the 17 Sustainable Development Goals (SDGs) on education is to ensure inclusive and equal quality education, as well as support lifelong learning opportunities for all.

Based on field surveys conducted by researchers, the educational problems that occur in junior high schools in North Sumatra Province indicate that the literacy and numeracy competence of students is still very low and needs to be improved. This is evidenced by the 2019 AKSI survey conducted by the Ministry of Education Assessment Center on junior high school students in North Sumatra Province showing the average value of literacy and numeracy skills is still below national standards. Look at chart 1:

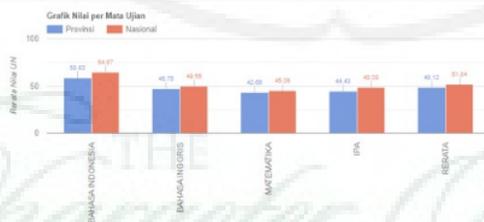


Fig. 1. Graph of Grades Per Eye of the Junior High School Examination in North Sumatra Province

Furthermore, the problem shown is the need to strengthen the character of students. This character strengthening is aimed at reducing cases of bullying (bully) in the school environment. Then, in addition, human resources (HR) are also relatively low. This is seen by the lack of integrated services in educational institutions, the lack of supervisory functions over the services provided, the lack of strengthened educational governance and, most importantly, the lack of quality in educators and educational personnel and other weaknesses during the learning process.

Faced with this situation, the **35** of Indonesian education also needs to change. The change aims to achieve the SDG's target in the field of education in the era of Society 5.0. Therefore, it needs to be discussed about the **3** challenges of Indonesian education solutions to 8 standards of education **7** quality in the face of the Era of Society 5.0 using society 5.0 support technology, namely the Internet of Things (IoT), Artificial Intelligence (AI), Robotics, and Distributed Ledger Technology (Blockchain).

2 Method

This research **14** describes solutions and challenges **26** to improving the quality of education in the era of society 5.0. The research method used in this study is qualitative research. Qualitative research is research that holistically intends to understand the phenomenon **2** of what the subject is experiencing, be it his behavior, perception, motivation, or action, and to describe it in the form of words and language, in a special context that is natural and by utilizing various natural methods **3**.

The data **15** collection techniques used in this study use literature study methods. The method of literature studies, which collects information or data through **5** books, research materials, seminars, journals, or articles relevant to the issue being studied **4**. This technique is carried out with the aim of revealing various theories that are relevant to the problem being faced or researched as reference materials in the discussion of research results.

Data analysis techniques conducted by research **6** using interactive models. Interactive models are divided into three stages, namely: (1) data reduction is a form of analysis that sharpens, classifies, directs, disposes of **11** necessary data, and organizes data so that final conclusions can be drawn and verified; (2) the presentation of data is a collection of structured information and gives the possibility of conclusions and action; (3) draws conclusions and verification **5**.

3 Result and Discussion

21 Factual Conditions of Education Towards the Era of Society 5.0

Towards the era of society 5.0 in the field of education, there are many challenges and changes that must be made. This is because the success of an application is determined by the initial state or readiness of educational institutions reviewed based on eight educational standards. These 8 educational standards will be a reference to whether they are adequate to be developed in preparing for superior and quality education.

The problem with education that is currently happening in Indonesia, especially in North Sumatra Province, is the lack of qualified professional teachers and the use of conventional and non-varied learning methods. Teachers are the agents who will make changes to the education

system. So teachers are required to be able to change their ways and views to improve the quality of Indonesian education.

In the era of society 5.0, teachers are required to be able to improve their professional abilities and teaching skills by using various varied methods and technology-based facilities while the learning process takes place. Teachers are not only required to provide knowledge but also must guide and facilitate the thinking power and learning motivation of learners to develop in accordance with the changing times. Hadi explained that at the micro level, in the framework of learning activities, the use of computer technology and the internet is still not fully conditioned in the classroom in all schools in Indonesia. Students will find it easier and more enjoyable to learn if they use computers and internet technology [6].

Other issues that are discussed include not only the quality of educators and education, but also the quantity. This is related to the equalization of teachers, which is seen in the number of teachers who are inadequate. The position of teachers is very vital in education, especially in terms of quantity. The problem that arises is the number of schools that lack teachers and even teachers who teach in accordance with their skills. One of the causes of the teacher shortage is Indonesia's vast geographical area [7].

Another problem involves the limitations of school facilities and infrastructure. The process of education in the face of the era of society 5.0 can be affected if the facilities and infrastructure are inadequate. Many problems will occur if there is a lack of facilities and infrastructure. Especially with the development of science and technology, learning activities certainly require efforts to use props and other practical tools that are sought to maximize the learning process. This is seen as inadequate in some schools in North Sumatra Province, especially those located in inland areas.

The considerable gap can be seen when compared to schools in urban areas. Some schools do not even have library buildings, laboratory buildings, or even fields used for certain sports because of limited land. Then the condition of the building is very unfit for use, such as leaking, which causes learning activities to be hampered. Although these facilities and infrastructure are what support the learning activities of learners both in class and outside the classroom.

The problem also lies not only in inadequate facilities and infrastructure, but also in the procurement and management process that must be carried out continuously. Observations show that schools may even have sufficient facilities and infrastructure but lack good management and maintenance. The school even ignored and paid less attention to this. Meanwhile, when viewed from its usefulness, the role of business management, procurement, use, and maintenance of facilities and infrastructure will make schools produce quality education and learning can occur as effectively and efficiently as possible.

Then, when talking about the procurement of facilities and infrastructure, other problems that arise are limited budget problems. Where the school budget is preferred to the operational costs of the school, the procurement of facilities and infrastructure becomes the last priority. In this modern era, the completeness of technological devices and other infrastructure will determine the progress or absence of an educational institution.

Another factor that is also very important in the 21st century is the lack of creative thinking, innovative thinking, and critical thinking about the actual issues that are occurring around us. This condition is not only trained and developed for learners. But to all stakeholders in educational institutions, today's education stakeholders are more interested in discussing and thinking about the differences between one institution and another. Whereas the desired condition is to bring up creative, innovative, and critical ideas to advance the quality of education.

With the many problems faced by Indonesian education, especially in North Sumatra Province, there are doubts about the readiness of educational institutions to welcome the era of society 5.0. The changes that will be faced will be more severe if the standard of education used as a reference to improve the quality of education is less maximal. The implementation of society 5.0 is not only aimed at students; all stakeholders are expected to be equally capable of dealing with this era on an individual, academic, and community level. This is in accordance with Raka's statement that quality education, according to the times, is seen in the products produced.

Whereas in its development, it is not only limited to complementing existing ones and increasing the targets that have been met, but it is also looking for opportunities that can produce something unique in this era [8].

Educational Difficulties for Society in Era 5.0

Of all the problems outlined earlier, it can be seen that the challenges of secondary education in North Sumatra in entering the era of society 5.0 are still quite a lot. How to realize all the indicators of the society 5.0 era, which include the internet of things (IoT), artificial intelligence (AI), robotics, blockchain, and big data with factual conditions.

The challenges that must be overcome are as follows:

a. Infrastructure Improvements

The need for infrastructure improvements throughout north Sumatra in order to create equitable distribution throughout the region so that there are no more hamlets or schools that are difficult to reach or difficult to get internet network. Of course, this requires collaboration from a variety of parties, including local governments, the federal government, providers, and the community. Infrastructural improvement is also one of the important factors in quality learning. By utilizing ICT and facilitating internet access, large-scale learning activities can be done anytime, anywhere. Information and knowledge can be communicated via email, Google Drive, e-Book, e-library, and other social media features without going through a face-to-face process [9].

b. Improvement of Educational Facilities and Infrastructure

Educational facilities and infrastructure in schools in north Sumatra still exist and do not meet existing standards, while we are entering the era of society 5.0, where all use the internet as a continuity of learning activities and digital equipment. Therefore, the school must be able to meet these requirements in terms of facilities and infrastructure, where all schools are connected to the internet and provide their own internet network, as well as have their own computer laboratories and other laboratories that can improve the competence of learners in terms of the development of innovation and digital creativity. Facilities and infrastructure are the first steps so that educators can try to get out of the "safe zone" and explore new learning potentials using a variety of different methods [10].

c. Developing Professional and Superior Digital Educators

In entering the era of society 5.0, educators, as the spearhead of this education system, must have superior quality in digital in order to hatch superior human resources later. So teachers have demands to be able to master technology. Not only technological literacy, but teachers must also have creativity and innovation that are continuously developed and have skills in leadership, digital literacy, communication, emotional intelligence, entrepreneurship, global citizenship, teamwork and problem solving.

A challenge for secondary education in north Sumatra is how to prepare the quality of teachers who master this technology thoroughly throughout the region. Varied learning strategies need to be applied by teachers in the era of society 5.0, namely by developing the potential of learners using teaching materials obtained from various platforms, both online

media and the real world [11]. If viewed at this time, then the search for teaching materials and learning videos has been found in various e-learning applications in Indonesia, such as Ruang Guru, Zenius.net, and Brainly [12].

So that it becomes the teacher's job to improve the quality and ability to use technology so that the quality of learning will also be better by utilizing technology in the era of society 5.0.

d. Preparing for 21st Century Life Skills

All elements of education, without exception, must equip themselves with 21st century skills, including creativity, critical thinking, communication, collaboration, leadership, digital literacy, emotional intelligence, global society, entrepreneurship, teamwork, and problem solving. This way, the output that will be generated from our education system will excel because it is ready to face the challenges of the society 5.0 era.

How to prepare for life skills in the 21st century must be considered by all elements of education to be applied into a habit that may be incorporated into the curriculum and so on. One of them can be done by teachers by creating competitive thinking through HOTS (Higher Order Thinking Skills). HOTS-based learning can be applied by teachers to hone critical thinking skills. According to Syahroni, critical thinking is an important contribution in educational institutions to improve the quality of education, accompanied by technological developments [13].

e. Strengthening digital ethics regulation and law enforcement

Entering the era of society 5.0, which emphasizes the massive use of the internet, it is inevitable that various digital crimes can also occur, starting from data theft, fraud, hacking, and other digital crimes that can harm many people, both from the lay community, educators, learners, and business people. For this reason, there needs to be clear and legal regulations and rules from the government and a strengthening of the law on digital transactions. This digital era is expected to change the character of society and learners' moral values as they become students of Pancasila's character, who are noble, pious to God, YME, global diversity, independent, critical-reasoning, and cooperative.

4 Conclusion

Based on the above exposure, it can be concluded that the most basic things that need to be done by the first secondary education institution (SMP) of North Sumatra Province to answer the challenges of education in the era of society 5.0 are: (1) improving infrastructure by using it evenly in each school; (2) completing facilities and infrastructure as a support for learning learners; (3) it is required to think critically, creatively, and innovatively as an initial provision to keep up with the times and compete in the future; (4) having digital ability as a skill to acquire and present positive learning/content so as to produce a capable output in literacy; and (5) form of character education, so as to apply moral values as students of Pancasila character who are noble, accountable to God, YME, and cooperation.

Acknowledgement

The advice that can be given based on the presentation is that all elements of society, especially in the field of education, both the government (education office), principals, teachers, school committees, students, and non-education personnel in North Sumatra immediately fix all factors so that they can compete both nationally and globally in living life in the era of society 5.0. as well as not only improving competence in knowledge, but must be able to develop technological skills.

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