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Transformation the World of Work in Educational Environment in Facing the Development of Artificial Intelligence for Sustainable Development Goals

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Abstracts

Seeing the rapid development of digital technology, causing major disruptions that cannot be avoided. This development has an impact on technological transformation such as artificial intelligence. As we can feel, technology is slowly taking over the world of work, one of which is in the field of education. This is slowly causing unemployment in several sectors and the possibility of losing their jobs. This research aims to measure the impact of artificial intelligence in the education sector. Where education is an important object of sustainable development. This research uses a descriptive analytical approach method with literature study. Data collection techniques were obtained from library sources in the form of books, scientific journals and relevant proceedings. Thus it can be concluded that technological transformation has both positive and negative impacts. Artificial intelligence can improve the essence in various areas of the world of work. The educational aspect of realizing quality technology can be seen from building a sustainable nation.

Keyword: Artificial Intelligence; Education; Sustainable Development Goals;

INTRODUCTION

Education is an important reason for the development of a country. Apart from that, good quality education is an important factor in the progress of a nation. The younger generation is not only being educated to be agents of change. However, it must be molded as a producer agent to create a real transformation. Education is a level that every person undertakes to explore their potential inside and outside the classroom. In pursuing education, there is no age limit for someone to seek knowledge. Because the depth of knowledge is a foundation for someone to achieve their dreams. Thus, education has a broad context for the development of social dimensions. Apart from that, from a social perspective, education will produce educated people who have an important role in social change in society (Suryana, 2020). Education is an important vehicle for teaching norms, socializing values, and instilling ethos among citizens, especially education in Indonesia.

In Indonesia, education is divided into three groups, namely Formal Education, Non-Formal Education and Informal Education. In this education, of course, there are different learning bases. Each education has different discussion and teaching potential. Education will be important because education is one of the spearheads of a country's progress. Education is a foundation or foundation for training a person's skills to develop their own potential. The role of education has several important components. These components include objectives, educators, students, tools, environment or institutions, curriculum, and evaluation. All of these components are related to each other (Aziansyah, et.al, 2023). If one of these components experiences problems then the learning objectives will not achieve good results.

Education in Indonesia still does not provide opportunities for students in various subjects to develop holistic, creative, objective and logical thinking skills. Apart from that, the ability to utilize quantum learning as an interesting paradigm in learning still pays little attention to individual learning completion (Muhidin and Al Faruq, 2018). This causes the readiness of human resources graduates in Indonesia to decline. Students' readiness to face the world of work is very closely related to the skills they have. The development of digital technology is felt by various graduates who are still unable to enter the world of work. The difficulty of getting a job in the world of work is one of the reasons that technological developments have begun to dominate existing human resources (Khayati, 2020).

Education is an important aspect in reviewing the development of digital technology. Where technology has an impact on several sectors, one of which is the employment sector. Apart from that, the challenges of technological development are like two sides of a coin that have positive and negative impacts

(Pabubung, 2021). One of them is a curriculum that is not relevant to the needs of the 21st century. This makes it difficult for graduate students to compete in facing global challenges. The development of the 21st century world is marked by the use of information and communication technology in all aspects of life, including the learning process. The world of work demands changes in competence. The ability to think critically, solve problems and collaborate are important competencies in entering a new life in the 21st century (Baroya, 2018). Technological developments cause changes in the qualifications and competencies of the workforce.

Apart from that, artificial intelligence makes existing technology in various parts of the world increasingly developed. The rapid development of technology makes artificial intelligence technology make it easier for humans to manage work in a company. Obtaining hard skills such as artificial intelligence can be obtained through formal education and training programs, including lectures, internships, short-term training classes, online courses, and certification programs, as well as on-the-job training (Baihaqi, 2021). This is done so that young generation graduates are able to compete with technological developments. Because if not, technology will dominate the world of work. However, teaching readiness at school is still said to be insufficient to deal with this problem. Considering that Indonesia is a developing country and is still in the rapid transformation stage into the digital era.

Departing from these problems, the concept of sustainable development emerged. Sustainable development can be defined as the ability to ensure development that can be carried out by meeting current needs. This aims to reduce or eliminate opportunities for future generations to fulfill their needs (Ghany, H. 2018). Implementing sustainable development requires global awareness by involving all parties such as government, industry players and education practitioners.

In this way, sustainability in the development of artificial intelligence technology can create a balance in preparing quality human resources. Where educational preparation at school can produce graduates who are ready to fight against the rapid digital current. Thorough preparation for classroom education is very necessary to prepare graduates who can compete globally. This aims to ensure that human resources can produce graduates who can compete with developments in artificial intelligence technology. Artificial intelligence should not be a problem for graduates who are ready to face the modern industrial world. With quality graduates, artificial intelligence can continue to develop. Instead of seizing the world of work that is needed by today's young generation.

METHODS

This research uses a descriptive analytical approach method with literature study. Descriptive notes contain factual information that describes something as it is. Data collection techniques were obtained from library sources in the form of books, scientific journals and relevant proceedings. Where this research uses literature study with content analysis methods (Mustofa, et al, 2023). The analysis taken is reduced first before being presented. Researchers have reduced the raw data and included it in the discussion according to the topic to be discussed. Next, the researcher examines the focus of literature observations by looking for relevant data according to the topic of discussion. Then present it in detail through primary and secondary literature sources related to the topic to be discussed.

In other words, descriptive analytical research takes problems or focuses attention on problems as they exist when the research is carried out. The research results are then processed and analyzed to draw conclusions. The use of this approach is adapted to the main research objective, namely describing and analyzing how educational transformation can affect the world of work. Apart from that, the rapid development of technology means that human labor is decreasing. This happens because the work systems carried out in various companies have implemented modern technology to speed up and make work easier.

RESULTS AND DISCUSSION

Student Worker Status in 2022

Based on the results obtained, according to data from the Central Statistics Agency of the Republic of Indonesia for 2022, it is clear that the percentage of students who decide to enter the world of work is quite high. Starting from the age of 10-24 years, most workers are still of elementary school age. The following are the results of the percentage of student data according to employment status in 2022.

Table 1. Percentage of Students Aged 10-24 Years Who Are Working According to Employment Status, 2022

Karakteristik	Status Pekerjaan				
	Berusaha Sendiri	Berusaha Dibantu Buruh	Buruh/ Karyawan	Pekerja Bebas	Pekerja Tidak Dibayar/Keluarga
(1)	(2)	(3)	(4)	(5)	(6)
Total	10,86	2,92	52,31	6,61	27,29
Jenis Kelamin					
Laki-laki	11,00	3,03	49,36	9,56	27,04

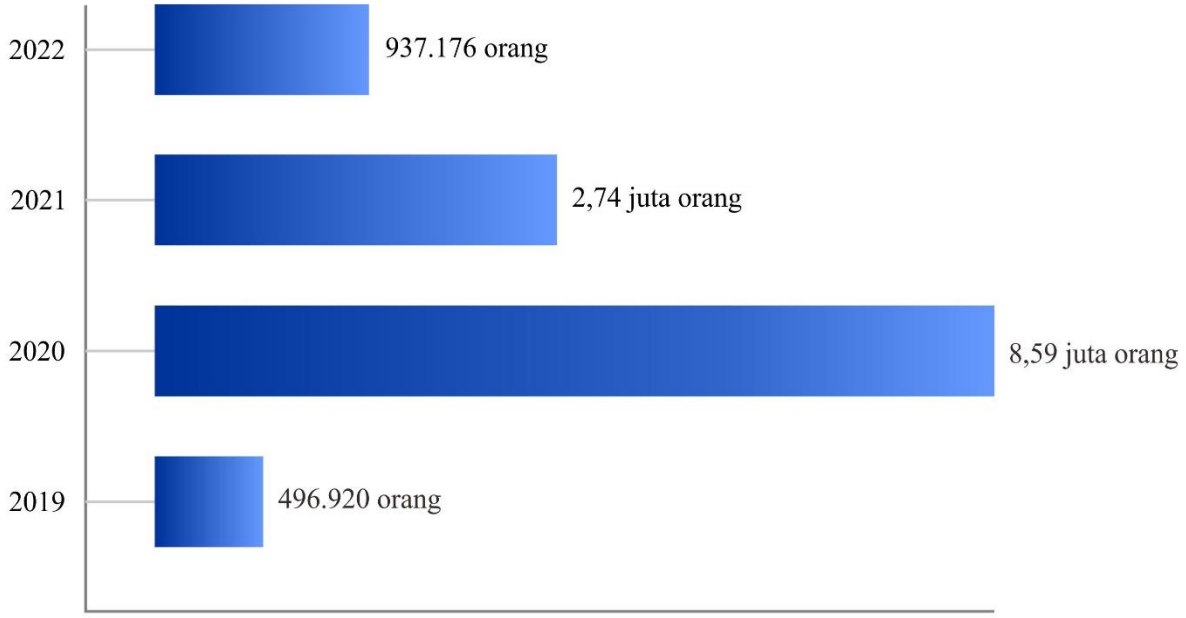
Perempuan	10,66	2,76	56,61	2,32	27,66
Status Disabilitas					
Disabilitas	3,77	2,97	45,40	8,79	39,06
Nondisabilitas	10,89	2,92	52,33	6,61	27,26
Jenjang Pendidikan					
SD Sederajat	6,42	0,81	3,25	3,33	86,19
SMP Sederajat	7,05	0,94	21,19	6,67	64,15
SMA Sederajat	10,48	2,06	38,89	7,69	40,88
PT	11,79	3,59	63,64	6,44	14,55
Kelompok Pengeluaran					
Kuintil 1	9,45	2,81	37,49	9,09	41,16
Kuintil 2	9,66	2,59	46,86	9,94	30,95
Kuintil 3	10,48	3,19	52,71	4,95	28,66
Kuintil 4	12,10	2,26	57,83	6,18	21,64
Kuintil 5	12,20	3,70	62,83	3,78	17,49
Klasifikasi Desa					
Perkotaan	11,13	2,57	66,68	5,02	14,60
Pedesaan	10,53	3,36	34,24	8,62	43,25

Source: BPS, Susenas Maret 2022

Percentage of Job Seeking Population in 2019-2022

The Central Statistics Agency recorded that there were 937,176 people looking for work in 2022. This number has decreased from the previous year of 2.47 million people. The percentage reduction in this data was 65.76% (Central Statistics Agency, 2022). The following is a record of data on the number of residents looking for work from 2019 to 2022.

Table 2. Number of Registered Job Seekers in Indonesia 2019-2022



Source: Badan Pusat Statistik (BPS) 2022

Looking at the data recorded in 2020, many people are looking for work due to layoffs (PHK) due to the Covid-19 pandemic. However, after the pandemic ended, Indonesia's economy slowly began to improve. This is because job seekers are starting to get their jobs back. As a percentage, the number of job seekers has fallen in the last two years.

The Role of Artificial Intelligence in Digital Industrial Systems

a. Computer Integrated Manufacturing

Computer-integrated manufacturing (CIM) is a term used to completely describe automation, manufacturing process planning, with all processes functioning under computer control and digital information carried out in a system together (Lubis, 2021). Computer-integrated manufacturing (CIM) itself is manufacturing that uses computer systems to integrate and control production systems. The use of computer-integrated manufacturing (CIM) can make manufacturing in a company faster and minimize errors in the production system. Computer-integrated manufacturing (CIM) is known as flexible design of manufacturing systems.

In addition, Computer-integrated manufacturing (CIM) is at the heart of Computer Aided Design (CAD) and Computer Aided Manufacture (CAM). CAD itself functions to make it easier for designers to create electronic drawings. The image is made into two dimensions or three dimensions and can be rotated to be seen from all angles. This software program also provides facilities that can analyze and carry out experiments on the design before it is realized. The CAM

software also provides facilities to display the machining process flow that will be carried out on the product that has been designed (Lubis, 2021). CAM also functions as a database record that can quickly identify production process problems in a company.

b. Machine Learning

Machine Learning is used as a pattern recognition and learning system. Apart from that, Machine Learning can be defined as the application of algorithms and computer mathematics to study and predict the future. This program asks questions about how to build computer programs so that they improve automatically based on experience (Roihan, 2020). Machine learning has the ability to provide intelligence to computers based on examples, so that they have the capability to carry out decision making and classification (Bambang, 2020).

Apart from that, according to Geron and Aurelien in Astuti (2021) machine learning is also often referred to as the science and art of computer programming which is studied through data. In general, machine learning consists of 4 parts, namely:

1. Supervised learning, is a dataset used that has labels. Labels are identifying tags for data. Spam email classification is an example of supervised learning.
2. Unsupervised learning, the dataset used does not have labels. This model does its own learning to label or group data.
3. Semi Supervised is a combination of supervised learning and unsupervised learning. In a semi-supervised model, some datasets have labels and some do not for training.
4. Reinforcement Learning is a learning model that uses a reward and penalties system. Reinforcement Learning is a learning model that gets rewards and avoids penalties.

c. Deep Learning

Deep Learning is a part of machine learning that uses layered algorithms in an effort to understand data better. And the use of algorithms used is no longer limited to creating a series of relationships that can be explained as in more basic regression but to create distributed representations that interact based on a series of factors. Deep learning relies on layers of non-linear algorithms. The breadth of the data set in training means that machine learning algorithms can begin to identify relationships between elements. The relationship can be between shapes, colors, words, and others. so that the system can then be used to make predictions (Pakpahan, 2021).

According to Deng and Yu (2019), the meaning of deep learning is explained as an algorithm used in machine learning that continues to learn continuously at various levels and according to different levels of abstraction. And usually uses artificial neural networks. And the studied statistical models correspond to different levels of concepts, where higher level concepts are determined from lower levels of statistical models, and lower level concepts can help to define many higher level concepts.

d. Computer Vision

Computer vision is a part of artificial intelligence that trains computers to interpret, interpret or understand things related to visuals or human vision. Visual computers use images obtained from digital or video cameras, from deep learning-based models, which can identify and clarify objects and the main goal of AI-Vision is to automate human tasks visually (Utama, 2020).

Introduction to Artificial Intelligence for Students to Face the Challenges of the World of Work

Of course, we have often heard what artificial intelligence is. Artificial intelligence is the ability of machines to learn using algorithms and use what they learn to make decisions like humans (Farwati, 2023). Artificial intelligence is also a system that thinks like humans; a system that behaves like a person; rational thought system; and a fairly functional system (Arief, 2019). Apart from that, this technological capability is designed using an intelligence system like that of humans.

One of the goals of artificial intelligence is to make human work easier to do. Apart from that, artificial intelligence will minimize errors made by humans. Because the system carried out by the computer is a specific result of the errors that will be made. The work process of artificial intelligence technology resembles human abilities in processing information, receiving, storing, processing, and transforming information into various forms of display. This process is known as the intelligence cycle in artificial intelligence (Farwati, 2023).

Artificial intelligence is certainly very important for the development of current technology. This is because humans will continue to develop advanced technology according to the era they live in. In addressing the issue of artificial intelligence in the scope of education, of course this is an important matter. Where the younger generation must be prepared as early as possible to be able to compete with technological developments. This aims to prepare the younger generation to face the world of work. Preparation in the world of education as stipulated in the Education and Culture regulations of the Republic of Indonesia

states that formal education in Indonesia is carried out for 12 years. Starting from elementary school, middle school, high school/vocational school/MA.

SMA and MA are almost the same, both study science in general. The difference is that MA studies more religious knowledge. Likewise, SMK and MAK both study special skills, the difference is that MAK is supplemented with religious knowledge. High school and MA students do not get special skills, so usually they will continue to a higher level to get special skills, namely college so they can compete in the world of work. In contrast to SMK and MAK, the educational curriculum has been prepared after graduation and already has special skills and is ready to work, but it does not rule out the possibility of continuing to college to gain more skills (Baihaqi, 2021).

Based on existing assumptions, vocational education is a unique type of education because it aims to develop understanding, attitudes and work habits that are useful for individuals so that they can meet social, political and economic needs according to their characteristics. Vocational education and training is an educational approach that emphasizes industrial needs so that individual improvement and development can be carried out in industry (Zaib and Harun in Ghufron, 2018). This is certainly a challenge for the government to minimize existing unemployment. The government, through policies across ministries and institutions, has issued various policies. One of the government's policies is the revitalization of Indonesian vocational education. Support from the government includes; 1) learning systems, 2) educational units, 3) students, and 4) educators and educational staff are also needed. Revitalization of the learning system includes, 1) curriculum and character education, 2) learning materials based on information and communication technology, 3) entrepreneurship, 4) alignment, and 5) evaluation (Ghufron, 2018).

Apart from that, the most important thing in responding to this is in the field of technology. Where students must be prepared as early as possible in school to prepare for the challenges of the world of work. The introduction of digital learning systems must also be implemented. Like learning during the Covid-19 pandemic which made all schools implement online learning. Digital platforms such as e-learning, Google Meet, Zoom meetings, and so on need to be introduced to children. This aims to prepare children for the challenges of technology in the world of work. Educators play an important role in dealing with these problems. This is because educators are a reflection of success in producing the nation's generation. So it is appropriate for education in schools to apply a digital basis to produce quality seeds for the future.

ANALYSIS

Analysis of the findings and results obtained in this research shows that aspects of education from an early age are really needed. Seeing the

development of technology which is currently developing rapidly. Graduates' readiness is a benchmark in facing the challenges of the world of work. As in the data that has been presented according to the 2022 Central Statistics Agency, it is explained that there were 937,176 people looking for work in 2022. This has experienced a drastic decline after the Covid-19 pandemic, amounting to 8.89 million people. Thus, it is certain that there are still many Indonesians who have not found work.

Various kinds of problems are experienced by students in looking for work. Learning readiness is also an important strategy in preparing graduates who are ready to face the world of work. The majority who are ready to face the challenges of the world of work are in SMK/MAK which have special skill competencies in their fields. This is different from high school graduates who have to go to college to prepare skills in their field. However, there are several schools that apply special learning to prepare graduates who can compete in the world of work.

The introduction of technology while at school is also important. Where this supports transformation in the world of education. As we can see during the Covid-19 pandemic. Where students apply an online learning system. This was done because the implementation of offline schools could not yet be carried out considering the increasingly severe pandemic. However, online learning creates a new world for children in introducing the digital world. Indirectly, children will learn how the digital system is done. This certainly needs to be done so that in the future when children reach adulthood they already know technology on a broad scale. So educators need to prepare graduates from an early age for digital developments so that Indonesia's future generations are not left behind.

CONCLUSION

Education is one of the most important bases for the young generation in Indonesia. An important aspect of education arises from the readiness of graduates to face the world of work. Where human resources are prepared to support quality graduates. This makes education the spearhead for Indonesia's young generation. Apart from that, graduates are prepared as early as possible to face technological developments. Where we can see that technology is developing rapidly. Currently we can see that technology has entered the scope of the world of work. Apart from that, technology has become an important aspect of human life. Technology has become a source of life for today's society. Where society cannot live without technology. This is what makes humans tend to always develop technology as best as possible. Apart from that, we can see that the problems graduates face in the world of work are quite significant. Looking at 2022, 937,176 people will still not get a job. The systemization of the

factory industry which is starting to master artificial intelligence technology means that human labor is no longer needed. The speed and efficiency of errors in production means that intelligence is starting to be used by investors. This causes human labor to begin to decrease. Apart from that, graduate readiness is also an important factor in facing digital technology. This happens because graduate readiness is very necessary. So by preparing quality graduates it will make competition in the world of work easier. Modern education in schools must also be implemented. By introducing children to digital systems, it will create a foundation for children when they graduate from school. This needs to be prepared to reduce unemployment due to the unpreparedness of human resources in dealing with artificial intelligence technology. Because education is one of the pillars of sustainable development goals (SDGs).

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