

THE ROLE OF EDUCATORS AS 'AMONG' IN EDUCATION IN THE ERA OF REVOLUTION 4.0

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Abstract (English)

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Latar Belakang: Pendidikan merupakan bagian dari hak asasi bagi seluruh umat manusia. Dewasa ini pendidikan berhadapan dengan berbagai fenomena sosial seperti “banjir informasi” dan ‘hoaks’ sehingga para pelajar mengalami kebingungan dalam menjalani proses pendidikannya. Terinspirasi dari konsep pendidikan Ki Hadjar Dewantara, para pendidik dapat memanfaatkan Teknologi Informasi dan Komunikasi untuk mengupayakan fasilitas, koordinasi, serta dukungan bagi para pelajar.

Tujuan: Penelitian ini menggambarkan kondisi pendidikan khususnya bidang teknologi pada era Revolusi.

Metode: Peneliti menggunakan pendekatan kualitatif dengan penelitian deskriptif.

Hasil: Perlunya peningkatan informasi pada para pelajar dengan memanfaatkan teknologi khususnya teknologi informatika.

Kesimpulan: Peningkatan informasi akan menjadi dinamika dalam lingkungan akademik terutama bagi kehidupan para pelajar.

Kata kunci: Among; Revolusi 4.0; Teknologi Informasi dan Komunikasi; student-centered learning.

Abstract (English)

Background: Education is part of human rights for all human beings. Nowadays education is dealing with various social phenomena such as "flood of information" and "hoaxes" so students experience confusion in going through the educational process. Inspired by Ki Hadjar Dewantara's educational concept, educators can utilize Information and Communication Technology to provide facilities, coordination, and support for students.

Objective: This study describes the condition of education, especially in the field of technology during the Revolutionary era.

Methods: Researchers used a qualitative approach with descriptive research.

Results: The need for increased information on students by utilizing technology, especially information technology.

Conclusion: Increasing information will become a dynamic in the academic environment, especially in the lives of students.

Keywords: Among; Revolution 4.0; Information and communication technology; student-centered learning

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INTRODUCTION

Education is a process that cannot be separated from human life. "All people have the right to education", is the content of the *Universal Declaration of Human Rights* article 26 published in 1948. The right includes three aspects as follows. *First*, primary education should be available to everyone. *Second*, education is directed toward the development of humanity. *Thirdly*, parents are the first to have the right to choose the type of education for their children. In addition, in the *document A Human Rights-Based Approach to Education for All* published by the *United Nations Children Fund* (UNICEF) it is stated that the purpose of a human rights-based approach to education is "to ensure all children a quality education that respects and promotes their right to the highest dignity and development".

The term 'education' in English translates as 'education'. The word 'education' comes from the Latin 'Educare' plus the prefix 'e-' so it means "to pull/lead outwards". Therefore, education can be understood as an effort to 'pull' a person towards awareness at a certain level so that the person gains awareness of his identity to maximize his potential. Therefore, education leads to self-awareness and self-fulfillment.

The problem of education today is the circulation of so much information through mass media supported by technology that people, especially students, find it difficult to sort out which ones are good, true, and useful for themselves. In ancient times, information was very limited and the media used to convey it required large funds so that it became a 'privilege' for those who had access to wealth and power. Nowadays everyone can access information very easily and at a more affordable cost. However, the ease of obtaining access to information is not based on adequate literacy skills. As a result, the general public can use information carelessly from the mass media to disseminate it for a specific purpose without first reviewing the truth of the information. The problem is exacerbated by the actions of 'individuals' who fill the mass media with misinformation, better known as 'hoaxes'. Therefore, the role of educational institutions is needed not only to provide correct information but also to educate students to become individuals who can participate in

preaching the truth and filtering errors in society. For this reason, a simple but deeply rooted educational concept is needed in the culture of the Indonesian nation to produce students who can take on this role in society (Topan Yuniarto, 2021).

This paper will first contain the concept of one of the educational experts in the history of the Indonesian nation, namely Ki Hadjar Dewantara. The next section will contain an overview of education in the era of Revolution 4.0. Then based on the main concept of Ki Hadjar Dewantara related to education, it will be explained how technology can play a role in supporting the educational process. This paper closes with a conclusion.

RESEARCH METHODS

The methods section should be able to describe the research methods used, including how the procedure is carried out. Tools, materials, media, or research instruments must be well explained. If there are statistical formulas used as part of the research method, you should not write down formulas that are already generally accepted.

RESULTS AND DISCUSSION

A. Research Results

Education in Indonesia according to Ki Hadjar Dewantara

During the time of Ki Hadjar Dewantara (R. M. Soewardi Surjaningrat, 1889–1959) the educational atmosphere was influenced by Western (European) concepts due to Dutch colonialism. According to Dewantara, the concept of Western education applied in Indonesia at that time was based on governance, discipline, and order (*regarding, touch, in order*). Samho and Yasunari commented on the Western style of education applied during the Dewantara period, "This kind of educational character is in practice a rape of the inner lives of children. As a result, children are damaged because they always live under coercion/pressure". So, it can be concluded that the Western educational style applied in Indonesia during the Dewantara period did not match the culture of the Indonesian nation. This situation became the background for Dewantara establishing the Taman Siswa School as an 'alternative' educational institution at that time (Dewantara, 1962).

For Dewantara, education is "a guide in the life of growing children". Dewantara believes in the ability of students to grow and independently, thus the purpose of education for Dewantara is to "guide all the forces of nature that are in the children, that they may be like human beings and as members of the community may be as high as possible a". This understanding is derived from pedagogy during the Dewantara period, namely the theory of convergence (*convergentie-theorie*). According to this theory, humans are formed by two elements, namely the "baseline" (default condition/nature) and the "line of behavior" (environment/state). Dewantara believes that human nature has two sides, namely the physical side and the spiritual side. The physical side is related to the biological aspects of man and cannot be changed, while the spiritual side related to intelligence and mind can change with the influence of education and the environment. Students can grow into good people naturally, but because of external influences, students can develop into bad people. The teacher's job is to supervise and direct the natural developmental process. Thus, for Dewantara education is a guide for students, who naturally already have good qualities, to master themselves and overcome the bad influences that come from the environment around students.

The idea of education according to the concept of Dewantara is a human being with a positive character (ethical). Samho and Yasunari formulated a person with a positive

character as "a person who can know his nature, respect himself, respect others and his rights, and respect the preservation of nature". The role of educators (among) in education for Dewantara is as a personal model of positive character for its students.

The method offered by Dewantara is referred to as "Among". This method is not based on the concept of "regarding, tucht, en order" as western education but rather "orde en Vrede" which means order or order and peace. (Dewantara, 1962) *Among* can be interpreted as an effort made by parents to take care of their children, especially those who are still babies. In *nurturing* students, parents and teachers give students the freedom to move according to their own will. However, teachers and students will act, also by coercion when deemed necessary, if the expression of children's freedom has the potential to endanger their safety, disturb the peace of life of others, or undermine human and natural values. This praxis of *based* character education consists of three principles as follows. *First*, "Ing ngarso sung tuladha". This principle means that a teacher should be able to be an example for his students. In this case, the teacher stands before the students to become an ideal personality model that becomes the orientation of his personal growth. *Second*, "Ing Madya Mangun Karsa". Teachers need to be a person who works among their students and inspires and motivates students to develop themselves as a whole. In this case, teachers and students work together to work on a certain goal. *Third*, "Tut Wuri Handayani". Teachers need to provide support and motivation for their students to develop independently so that they become better and even better people than their teachers.

The Era of Revolution 4.0 and Its Effect on Education

According to the *Oxford Dictionary*, the word '*technology*' is understood as "the application of scientific knowledge for practical purposes, especially in industry". Whereas the *Collins Dictionary* defines '*technology*' as "methods, systems, and equipment that are the result of scientific knowledge used for practical purposes". In the *Big Dictionary Indonesian*, the term '*technology*' is understood as "the whole means of providing the goods necessary for the survival and comfort of human life". Thus, it can be concluded simply that '*technology*' means the use of scientific knowledge for specific purposes.

There are several types of technology as follows. First, is information technology. Information technology is a tool used to create, store, and process to obtain the desired result. Some examples include *Personal Computers* (PCs), telephones, mobile phones (mobile phones), radios, sound and video systems, *database servers*, and technology that is currently widely used, namely *smartphones* which are a combination of computers and *mobile phones*. Secondly, communication technology. Communication technology functions to convey data from one piece of equipment to another, for example from one PC to another. Communication technology is a variation of information technology, so in general, today information and communication technology are combined into one, for example in a PC there is an internet connection that can connect between PCs. Some examples of communication technologies include social media, messaging applications, teleconferencing, and *live chat* features. It is this type of technology that will be specifically discussed in this thesis. Third, is management technology. This type helps people who work as company managers to obtain better information to be able to produce better decisions. This technology allows its users to receive and exchange data allowing for more efficient management. Some examples include *Customer Relationship Management* (CRM) programs and *Project Management Software*. Fourth, *Artificial Intelligence* (AI). *Artificial Intelligence* is artificial intelligence that allows machines to think as if they were humans, that is, they can analyze problems, process data, and make decisions automatically. Nowadays, AI technology is quite popular considering that quite a lot of people access data on the internet so it requires a sophisticated enough AI to enter user data, process the data, and provide useful recommendations for its users. Fifth is *Blockchain Technology*. This technology is a record of data streams that can be continuously connected and secured using a technique called cryptography. A *blockchain* is a distributed ledger that can be accessed

by various parties to record transactions between two parties efficiently and verifiably and permanently. This blockchain technology was created by Satoshi Nakamoto in 2008 and is used as a ledger for bitcoin cryptocurrency public transactions.

Information and communication technology are closely related to the internet and social media. The progress of human civilization in the field of technology was formulated by Klaus Schwab in his book entitled *The Fourth Industrial Revolution*. In the book, Schwab marks the history of human civilization in the industrial sphere with the four stages of the industrial revolution. Before the industrial revolution occurred, humans first experienced the agrarian revolution, which is a stage when humans switched professions from previously obtaining food from hunting and collecting to the domestication of animals and plants through animal husbandry and agriculture. This stage does not count as an industrial revolution because goods are still made manually in homes so as not to allow mass production, which only happened in the era of the industrial revolution. The first stage of the industrial revolution is referred to as "Revolution 1.0". This stage occurred from 1760-1840. This revolution was triggered by the invention of the steam engine by James Watt and the construction of railway infrastructure. This allows production to be mechanized, that is, using steam engines, replacing manual production done by humans. The "Revolution 2.0" began in the late 19th century to the beginning of the 20th century. This revolution was made possible thanks to the invention of electricity and its lines. This revolution was then followed by the "Revolution 3.0" which was marked by the invention of the computer. The revolution that occurred in the 1960s was called the "computer revolution" or "digital revolution" because it was marked by the discovery of three main elements in computers, namely semiconductors in the 1960s, *Computer Personal Units* (CPUs) in the 1970-1980s, and the internet in the 1990s. Today the world has reached the current stage of the industrial revolution, which is "Revolution 4.0". The concept of "Revolution 4.0" was first coined at the "Hannover Fair" in 2011 in Germany. This revolution has been possible since the invention of "smart factories" that allow production to be carried out autonomously without human intervention. This fourth industrial revolution is marked by a wide variety of inventions in the fields of robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, *the Internet of Things* (IoT), 3D printing, and autonomous vehicles (Astrid Savitri, 2019).

"Revolution 4.0" not only enables connectivity between objects but also further facilitates relationships between people. In the field of information and communication technology, this era was marked by the development of smartphones (smartphones). Through these devices, it is easier for humans to connect through centuries of social media and applications. Chris Skinner revealed this fact by writing, "... we are building a smart planet in which everyone and all objects will connect and communicate with each other endlessly". Rhenald Kasali in his book entitled (Avelinus Moat Simon, 2019) *The Great Shifting* even said that the control of society, music, movies, commerce, advertising, toys, politics, matchmaking, and sex moved to digital *platforms*. On the one hand, this progress makes human life easier, but on the other hand, it turns out that this progress further distances man from his fellow man. This phenomenon was realized by Sherry Turkle who in her book entitled (Rhenald Kasali, 2018) *Alone Together* wrote,

"... we expect more from technology and less from each other. This puts us at the still center of a perfect storm. Overwhelmed, we have been drawn to connections that seem low risk and always at hand: Facebook friends, avatars, and IRC chat partners. If convenience and control continue to be our priorities, we shall be tempted by sociable robots, where, like gamblers at their slot machines, we are promised excitement programmed in, just enough to keep us in the game. At the robotic moment, we have to be concerned that the simplification and reduction of relationships are no longer something we complain about. It may become what we expect, even desire." (Sherry Turkle, 2011).

Through this statement, Turkle expressed concern that humans will depend more on technology than on each other. Human beings have become more resistant to living alone without their fellows than without information and communication technology.

The development of technology has also shaped the generation of humans. William Strauss and Neil Howe divided the generation of humans into four which are as follows. First, the *G.I. Generation*, or "Greatest Generation" was born between 1901 and 1924. By the time they matured, this generation experienced the events of World War II and was able to overcome them until they regained stability in economic and social life. Most of the technology in those days was used for war purposes and the internet was still not invented until 1960. Second, the *Silent Generation* was born between 1925 and 1945. This generation is called 'silent' because their characteristics are shaped by the assumption that children should not be seen and listened to so that they grow up to be a generation that is vigilant, established, and tends to follow the existing system rather than change it. This generation pioneered internet technology in 1960 with the construction of the *Advanced Research Projects Agency Network* (ARPANET) by the USA Department of Defense. This technology then developed into the internet in 1983 by combining it with the *Transmission Control Protocol and Internet Protocol* (TCP/IP) technology invented by Robert Kahn and Vinton Cerf in 1970. The third generation is referred to as *Baby Boomers* born from 1946 to 1964. This generation is so called because in that era many children were born after prosperity and peace were achieved after World War II. Parents of this generation do not want their children to experience the suffering they experienced when they were young as a result of war. In this era, commercial television developed. As adults, this generation experienced the internet growing with the invention of the *World Wide Web* by Tim Berners-Lee in 1990. The fourth generation referred to as *Generation X* was born in 1965 to 1980. This generation is experiencing growing public distrust of government and politics and rising divorce rates. As adults, this generation experienced the increasing use of *Personal Computers* (PCs) accompanied by the development of the internet. The fifth generation, namely *Generation Y* or better known as 'Millennials' was born between 1981 and 1994. This generation grew up when computers have become commonplace and become part of their daily lives. Nowadays, this generation is familiar with *smartphones* and uses various social media such as *Facebook*, *Whatsapp*, and *Instagram*. Finally, the sixth generation is referred to as *Generation Z* which was born in 1995 until now. This generation is commonly referred to as the "i-generation" or "Digital Natives" because they were born at a time when information and communication technology was developing rapidly. They have been able to use technology since their childhood. Based on this explanation, it can be concluded that this era is at least filled by three generations, namely X, Y, and Z. Generation X is generally the parent of their children which belong to Generations Y and Z.

The general characteristics of the current generation of human beings also influence the educational patterns applied to them. Today's education has been influenced quite a lot by technology. Based on recent studies, students are more likely to use technology and the way they learn gets its influence from the way they use technology because using their devices increases students' learning and interactivens. The role of technology in education can be formulated in four ways, namely as part of the curriculum, as a system for delivering lessons, as a teaching aid, and as a means to improve the overall learning process. The four roles of technology are evident in the dynamics of education today. Schools in urban areas have generally used modern learning facilities such as *laptops*, *LCD projectors*, *CPUs*, and the internet. In some schools, some even use the internet to convey the content of textbooks, reducing the use of paper or an exam sheet so that the results can be directly obtained by teachers with computer calculations.

The rapid development of information and communication technology today also shapes the face of education. In the past, education was more directed at teaching children to use hardware and software to support the educational process which still uses the 'old'

pattern, namely students absorbing and processing information that is entirely sourced from teachers. Today, information and communication technologies form a distinct characteristic of education, namely that learners explore the abundant science and skills that are freely available on the internet according to their interests and needs. This can be evidenced by the change in standards set by the (Rhenald Kasali, 2018) *International Society for Technology in Education* (ISTE), which is the institution that determines the standards of technical education in all schools around the world, in 2000 and 2016. In 2000, ISTE together with the United States Department of Education established competency standards for students so structured from Pre-kindergarten to class XII. Based on these standards, children are trained to gradually use hardware and software from computers to support their learning process in the classroom. Today, the same institutions have changed those standards. Seven criteria are more flexible to measure information and communication technology education for students, namely empowered learners, digital citizens, knowledge constructors, innovative designers, computational thinkers, creative communicators, and global collaborators. ISTE itself formulated that education in 1998 was focused on "learning to use technology" (learning to use technology) and in 2007 "using technology to learn" (using technology to learn), while in 2016 the goal of education was "transformative learning with technology."

Concretely, nowadays learning can be made possible online. For example, one of them is organized by the Santo Aloysius High School (SMA) Bandung. Due to the coronavirus (COVID-19) outbreak, learning is carried out *online*, namely through the 'Scola website. This phenomenon shows that information and communication technology is not only studied in teaching and learning activities in schools but rather changes the face of learning itself. Thanks to information and communication technologies learning are possible independently, but with a clear teaching system and a measurable evaluation.

The use of information and communication technology, especially the internet, in education, can have a positive impact on students. Neil Selwyn formulates the four positive impacts of internet use in education as follows. First, the possibility to increase the freedom of learners from physical restrictions from the real world. Learners can access high-quality lessons and useful education by reducing barriers to places, geographical conditions, and places by accessing them via the internet because lessons can be accessed anytime and anywhere as long as they are connected to the internet. Second, the internet supports a new culture of learning called "bottom-up" based. This means that learning is derived based on engagement, research, and collective innovation rather than "top-down" instruction derived from a learning resource, for example from a teacher to his or her students. Third, the capacity of the internet to support mass connectivity between society and information radically affects the relationship between the learner's person and knowledge. The Internet supports a process of knowledge creation and absorption that is very different from the epistemological presumptions produced by formal education and mass instruction. Fourth, the internet can make people's way of learning more personal. Learning is not determined by a mass curriculum but is adapted to the conditions and needs of the individual who is learning itself. This allows each individual to organize his or her way of learning and accumulate knowledge independently without relying on the learning norms and targets set by the education system.

However, it is undeniable that there are also some problems caused by the use of information and communication technology in the learning process. John Palfrey and Urs Gasser formulated three problems that can result from modern learning utilizing the internet. First, the problem posed by the tendency to *multitask* is to do several things at once simultaneously at about the same time. For example, if students use the internet while studying in class, they have the potential to do and access lessons and social networking sites, games, music, and so on. This tendency reduces the student's focus when taking the lesson. Second, the previous problem resulted in a weaker ability of learners to concentrate because they had "short attention spans". This has resulted in today's learners being more

likely to read short scientific writings than thick books, as well as other forms of learning materials in the form of text, audio, and video. It also affects the way they communicate. Nowadays, young people tend to prefer listening to *podcasts*, which are short recordings, rather than radio broadcasts or taking lessons that can take hours. Third, technology can lead learners to a "copy and paste" culture. Nowadays, in creating assignments, students tend to copy and link material from the internet easily, sometimes without even including the source of the internet site where they obtained the information. This problem has led to a diminishing of the originality of scientific writings produced by today's learners.

A more fundamental issue related to education today was also raised by Yuval Noah Harari in his book entitled *Homo Deus*. Harari concluded that education is concerned with who or what is the source of meaning as well as the authority that determines that meaning. Harari describes that in medieval times the source of authority was a fairly solid institution, for example, the Roman Catholic Church, so education at that time was directed at the cultivation of obedience, memorization, and understanding of the text of the Scriptures, as well as the study of ancient traditions such as Hebrew, Greek, and Roman. In the modern era, which began during the development of humanism thought, this authority was shifted to the man himself so that even in education man was directed to listen to himself as the source of truth. But in the era of the development of information and communication technology, Harari argues, that experts, especially biologists, increasingly agree that humans are algorithms so it opens up the possibility for technology to manipulate both human physical and mental situations. This way of thinking also affects the perspective on education. Harari considers that education in the past, and also still lived by some current institutions, is too focused on the process of providing information to students and assessing how that information is remembered and understood by students. Nowadays, information can be obtained easily thanks to the help of information and communication technologies so the role of educational institutions as providers of information has become less relevant. Therefore, Harari argues that today's education needs to be directed towards "the ability to understand information, to distinguish between what is important and what is not important, and above all to combine a lot of information into a broad picture of the world". Thus, it can be concluded that education today no longer plays a role in providing information for students to remember and understand, because this role has been taken over by information and communication technology, on the contrary, education plays a more role in shaping the characteristics and competencies of students to face the development of today's world, namely by continuing to learn and adjusting to the situation and needs of society based on what they learn (Harari, 2018).

Ki Hadjar Dewantara's Thoughts as Inspiration for Education in the 4.0 Era

Nowadays, a new educational concept has emerged, namely Student-Centered Learning. The essence of the concept is that in education the teacher is no longer the only source of learning in the classroom, but learners can gain knowledge and experience independently from their own experience. In this understanding, the role of educators is to facilitate, coordinate, and support students in the educational process they are currently undergoing. The concept can be included in the framework of the concept of 'Among' according to Ki Hadjar Dewantara, namely "Ing Ngarso Sung Tuladha", "Ing Maya Mangun Karsa", and "Tut Wuri Handayani". In this section, it will be explained concretely the use of Information and Communication Technology (ICT) in supporting the role of educators in assisting the student learning process.

The essence of the concept of "Ing Ngarso Sung Tuladha" is the role of the educator as a "role model" or role model for his students. Before the existence of ICT, an example was generally given by the presence of teachers in person in class and meeting with their students. Nowadays, with a large number of students and not balanced with the number and quality of adequate educators, it is difficult for the student education process. In this case, educators can take advantage of ICT by providing 'tutorials'. According to the *Cambridge*

Dictionary, the term 'tutorial' can be understood as a document or site on a computer that shows how to use a product in a series of simple stages. One alternative that can be used is a *website* called Khan Academy. The site contains *video tutorials* and practical exercises that can be used by educators to provide examples of working on a problem accompanied by exercises that can be done by students and used by educators to evaluate the learning process. In addition, educators can also take advantage of social media that are popular today such as Youtube, Instagram, or Tiktok to share their experiences and inspirations related to the learning materials that are currently in the students.

The concept of "Ing Madyo Mangun Karso" means that educators walk with students and become a means of connecting students with diverse interests and talents to learn and collaborate. The concrete form of the role of this educator is the Merdeka Belajar dan Kampus Merdeka (MBKM) program pursued by the Indonesian Ministry of Education, Culture, Research, and Technology (Kemendikbudristek). Through this program, the Ministry of Education and Culture facilitates students to conduct independent studies, conduct internships, and participate in interuniversity and interregional student exchange programs. In this way, students can have more knowledge, experience, and relationships as widely as possible so that they have more preparation when entering the world of work or service in the community.

In addition to examples and wide opportunities to seek experience and networking, educators also need to remember to strive for "Tut Wuri Handayani" which is to provide motivation and support for students to move forward. One of the issues that are quite interesting for students, who in general are teenagers who are still in the character-building stage is depression. In short, depression is a mental illness that occurs when a person feels sadness and worry for a long period so that they are unable to live their life normally. In general, educational institutions such as schools and universities will seek to help students overcome these problems through direct counseling with teachers, counselors, or psychiatrists at the school or campus. However, there is a tendency for students to be reluctant to use the facility because they feel uncomfortable or worried about negative views from others if they openly see a psychiatrist at school. Therefore, teachers can use communication media such as Whatsapp, Google Meet, or Zoom to hold indirect meetings to help students overcome their problems. In addition, students can also suggest various sites providing psychiatric consultation services *online*, for example, One Percent. In this way, it is hoped that educators will not only help students to progress and develop, but also have a more mature person and be more resistant to the various pressures that they currently face and later in life.

CONCLUSION

The development of the times in the Era of the Industrial Revolution 4.0 has had a significant impact on various aspects of human life, one of which is education. An ancient educational model that was oriented towards educators and emphasized acceptance and remembering information by learners needs to be abandoned. Educators can take advantage of technology, especially ICT in pursuing an educational process by providing facilities, coordination, and support for students. In this way, the educational process is not only a dynamic that occurs in academic environments such as schools and universities but rather becomes a continuous process in the concrete life of students.

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