Determination of the external potential of education in the era of the industrial revolution 4.0 and society 5.0 in Indonesia

Anatun Nisa Mun'amah[1]

[1] UIN Sulthan Thaha Saifuddin, Jambi, Indonesia, anatunnisa.munamah@gmail.com

Corresponding Author: anatunnisa.munamah@gmail.com

Abstract: Determination of the external potential of education in the era of the industrial revolution 4.0 and society 5.0 in Indonesia is a scientific article in the literature study within the scope of the management of education. This study aims to provide an analysis of the determination of the external potential of education in the era of the industrial revolution 4.0 and society 5.0. obtained from the results of a literature review or literature study by comparing various written sources such as articles, journals and books that are relevant to the studies in this study. The results of this study provide an analysis that the presence of the industrial revolution 4.0 and 5.0 made a major contribution to Indonesian education. by creating change and preparing superior and innovative graduates with pre-prepared skills through revitalizing the education system by strengthening the elements in it, both quality human resources, infrastructure that supports digitalization, and curriculum alignment that is integrated to five basic values, namely resilience, adaptability, integrity, competence, and continuous improvement.

Keywords: Society 5.0, Determination, External Potential, Industrial Revolution 4.0.

INTRODUCTION

A number of year Lastly, speed development technology intelligence artificial (Artificial Intelligence) has accelerated and used globally so it is very influential various industry , infrastructure , social , and activity man other . Development very fast technology the cause change mark society. New value created by development _ technology called industry 4.0 and society 5.0. Technowijoyo and Merlina (2021) say in his research that presence revolution Industry 4.0 and Society 5.0 have relevance to education in Indonesia. Because good Industry 4.0 and Society 5.0 emphasize readiness to develop creativity and thinking critical, p This in line with objective education in Indonesia.

Presence revolution Industry 4.0 and 5.0 deliver contribution big to Indonesian education. One of them is exists innovation based learning facilitating technology student in Study without know space, time and place. Because That development revolution Industry 4.0 and 5.0 are expected bring progress for development education especially in Indonesia

with create change and prepare excellent and innovative graduates with existing skills be prepared before (Teknowijoyo & Marpelina, 2021).

Industry 4.0 is Name trend up-to-date data automation and exchange in technology factory. this term covers system cyber-physical , internet for everything, computing cloud, and computing cognitive (Lasi, Kemper, Fettke, Feld, & Hoffmann, 2020). Industry 4.0 produces " factories smart ". Inside factory intelligent structured modular, system cyber-physical supervising physical processes, creating copy of the physical world virtually, and create no decision centered. Via Internet for everything (IoT), system cyber-physical communicate and work The same with One each other and humans in a manner together. Past computing cloud, internal and cross services organization provided and used by various inside party chain value .

Moderate revolution faced moment this. Although Still in stage of the revamping process, however impact Already felt. Industry 4.0 is trend major in the world 's combining industry technology automation with technology cyber . Germany is the country of origin Industry 4.0 marked with a technology strategy advanced priority government _ computerized factory. On the revolution industry this power _ manufacture Already become trend automation and data exchange includes system cyber-physical, cognitive computing and others.

The trend has change pattern thought and life humans in various fields, including the world of work, education even style life the people. In short, revolution Industry 4.0 makes technology intelligent or robot as center Main to connect various field life man (Arifin, 2017).

Meanwhile Society 5.0 or Super Smart Society (Shiroishi, Uchiyama, & Suzuki, 2018) is draft the future society proposed by Japan that is a balanced human centered society progress economy with settlement problem social through highly integrated system virtual world and space physical . society 5.0 is proposed in The 5th Science and Technology Basic Plan by the former Prime Minister of Japan The inaugurated Shinzo Abe year 2019.

Different with Industry 4.0 Germany and the Industrial Internet from General Electric United States, which focuses only on innovation manufacturing and upgrading productivity through ICT and IoT, society 5.0 is draft comprehensive effort solve various problem social with change " condition society " through digital transformation such as ICT and IoT (Fukuyama, 2018)

Education plays very important role in repair quality source Power in standard life continued social _ developing in the world/ global society. System proper education _ bring progress for a country. Existence something nation can exist through contribution to world civilization. So education continues adapt as well as align with progress technology (Fahrezi & & Susanti, 2021). because _ That study This trying to deliver synthesis as well as analysis deep regarding 1) the concept of industry 4.0 in Education, 2) The concept of society 5.0 in Education and 3) Development of the Revolutionary Era Industry 4.0 and Society 5.0 in determination Potency External Education.

METHODS

Study This is studies literature with type study qualitative descriptive with study bibliography (library research) sourced from *Google Scholar* online application, *Mendeley* and applications other online academics. who try describe potency development industry 4.0 and society 5.0 towards education in Indonesia. Overview References aims to identify aspects central from Industry 4.0 and society 5.0 in order to get obtain definition term this can _ accepted well by researchers nor practitioner (Cooper, 2018).

In qualitative research, literature review must be used consistently with methodological assumptions. This means that it must be used inductively so that it does not direct the

questions posed by the researcher. One of the main reasons for conducting qualitative research is that the research is exploratory in nature, (Ali, H., & Limakrisna, 2013).

RESULT AND DISCUSSION

Results

Based on background back, goals and methods, then results article This is as following:

Society 5.0

Society 5.0 is something draft use based human centered society. This technology was first developed by Japan (Shiroishi, Uchiyama, & Suzuki, 2018). Draft This born as development the 4.0 revolution that started use various technology originating massively _ from optimization utilization of the internet of things (tools that can sending data via the internet), then saved into big data which is then processed by artificial intelligence. this _ Then can give birth to factory intelligent and intelligent robots that maximize function from the internet (Lasi, Kemper, Fettke, Feld, & Hoffmann, 2020).

Impact from development technology massively have _ bring civilization man entering a new era called with the era of society 5.0. in the era of society 5.0, technology is part from man That alone. Internet does Again be a medium for nothing share information but is device to live life for human (Ruskandi, Pratama, Asri, & N, 2021, p. 21).

this _ is draft public human centered and based _ technology (technology-based). In the the concept of society 5.0 is human will role big with transform big data into something wisdom new in the end increase ability man open opportunities for humanity to achieve life mean.

External Potential of Education

Potency education can rated based on component source power and results. Component source Power evaluated through two groups indicators: 1) Education development scale, namely evaluation scale development education consists from analysis spatial network institution education and numbers employed staff _ in Education. 2) Degrees educational development, that is rated in two directions ie degrees sectoral and level potential provision service sector education.

For evaluation quantitative potency education, indicators following analyzed: Implementation of the learning process teaching (facilities and resources Power institution education); Provision level staff teachers and their quality; Support finance for education.

Provision service education estimated based on: Total participant training / students institution education and school technique vocational training per 10,000 people; comparison amount population covered by one type education with amount resident who can covered by type the same education;

Group indicators , like indicator quantitative potency education (education fund (EF), index combined EF, physical volume index of education funds , index total EF value), indicator saturation sector economy with qualified staff (percentage of people with education high , technical special and intermediate from total number of working population , factor saturation sector economy with professional , factor reason saturation giver qualified work , factor reason more boredom tall saturation professional education) and indicators utilization potency education residents (loss of education funds Because unemployment factor EF use).

In assessing effectiveness cost education as results from potency education, two aspects following must considered: effectiveness cost education external (value added energy created Work quality), effectiveness internal costs of education (characterize efficiency activity education).

because it is necessary using data analysis statistics to diagnose potency education, in particular amount college heights and institutions training, amount population and students in the area, total field staff education, and financing field education. Dimensions external

education covers dimensions social, political, economic, cultural, and even global dimensions.

Dimensions - dimensions social education in question in aspects social education are: a. Aspect inculcated by the education prevailing in schools. Like inheritance culture from generation old to generation young. inheritance values such as: honesty, solidarity, mutual cooperation, because values That as unifier in society. b. Aspect second social influence education is characteristic features dominant culture in the area particular in which schools That exist. c. Aspect social third to play role in education that is factors organization, and facet bureaucracy. d. Aspect social fourth most important influence education is system education That alone.(Khafidah, 2020)

Educational development from dimensions politics at its core discuss connection between policy influencing politics policy education, with attention main role power in making decisions about education. Whereas knowledge education and administration education have room more scope wide again. Besides peeling ways allocation source Power education as well as balance use source Power with quality result to be achieved from time time in a manner Keep going continuously.(Fiske, 2016)

Dimensions economy education is one source that power direct support effectiveness and efficiency management education. In maintenance education, finance and financing is very decisive potential and is the part that doesn't inseparable in study management education. Component finance and financing on a school is component decisive production implementation activity teaching and learning at school together with other components. In other words every activities carried out school need cost, fine That realized or not realized. Component finance and financing This need managed as well as possible, so that the funds are there can utilized optimally for support achievement educational goals.

Education is believed influence culture. Consider term like intercultural or multicultural, this explain connection between two or more group different population in a manner culture through acculturation. For example, exchange knowledge through education between two cultures. This is also possible involve connotation defining politics back cultural boundaries and with thereby unite different nations and populations. (Maseman, 2019)

Revolution Era 4.0

Industry 4.0 is Name trend up-to-date data automation and exchange in technology factory. this term covers system cyber-physical , internet for everything , computing cloud , and computing cognitive (Lasi, Kemper, Fettke, Feld, & Hoffmann, 2020). Industry 4.0 produces " factories smart ". Inside factory intelligent structured modular, system cyber-physical supervising physical processes, creating copy of the physical world virtually, and create no decision centered. Via Internet for everything (IoT), system cyber-physical communicate and work The same with One each other and humans in a manner together. Past computing cloud, internal and cross services organization provided and used by various inside party chain value .

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Discussion

Based on theoretical studies so discussion article this literature review is review relevant articles, analysis between variables and create conceptual think system as following:

The Concept of Industry 4.0 in Education

Industrial revolution 4.0 is an era of innovation disruptive. Where is the innovation growing very rapidly, so open opportunity for creation of new markets (Sabri, 2020, p. 2). Disruption era is a time that threatens and has challenge heavy on life human. For those who don't capable adapt with change, of course just will experience Lots difficulty in wade wave life full everyday _ changes and loads competition.

Education is the part that doesn't inseparable from life human. A popular saying says that whatever activity a life lived by a community, a lot determined by the educational activities it receives. Because in a manner experience Already is need life human.

Knowledge knowledge mature This experience such developments fast. Development the has give birth to various progress technology, so man can feel various convenience and enjoyment live.

Revolution 4.0 with its disruptive innovation put Education as a system on some alternative choice that brings respective implications. Easy main road taken in facing this era is have Skills good behavior (Behavioral attitude), raise competence self and own Spirit literacy.

Revolution 4.0 gave birth paradigm think new and cultural new for life people human. A number of matter important necessary attention by the environment in Education face industrial revolution 4.0, among others (Lasi, Kemper, Fettke, Feld, & Hoffmann, 2020), the presence culture: 1) The marked era of disruption 4.0 with Features: Most company use technology to sell product they in a manner online and Increasingly importance deep social skills work. 2) The era of literacy 4.0 consisting from: Data literacy is ability to read, analyze, and use information (big data) in the digital world and literacy technology , that is ability understand method Work machines and applications technology (engineering principles, artificial intelligence, and code).

With that needed capable competence offset presence culture beru the in Education. Required competencies is one form projection on needs in the 21st century Skills think critical and solving problem, skill communication and collaborative, skills think creative and innovation, skills literacy technology information and communication skills learning contextual, as well literacy information and media.

In addition, development is also needed policies for synergy institutions and eras can Keep going walk in a manner balanced and harmonious that is, with plan hala following: 1) Elementary and secondary education must own paradigm new aligned with the industrial era 4.0 namely revise curriculum with add five competencies mandatory importance owned by each individual participant educate. Among them ability think critical ability think creative and innovative, abilities and skills good communication skills Work together and collaborate and trust self. 2) Reorient curriculum for each education level with do a number of matter following: develop and teach literacy new (big data, technology, coding, humanities), strengthening activity extracurricular specifically in development leadership and work in team, obliges schools and participants educate enter to the entrepreneurship and internship areas, implementing a hybrid/ blended learning and online teaching system.

This era of industrial revolution 4.0 Can said as challenge as well as opportunities for Education in Indonesia on an ongoing basis general, is every formal educational institution prepares myself to be able to enter half new such a changing world fast. Change infrastructure and resources Power Human Education is something inevitability. Lateness self in adapt to change will lead to downturn and backwardness.

The concept of society 5.0 in education

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Indonesia is a multicultural country diverse culture, ethnicity, race, religion, and custom customs. As a multicultural country of course become A big challenges and also big opportunities in the field of Education. Chances and odds is with introduce uniqueness culture that exists in Indonesia, so that the world can know as well as confess uniqueness diversity culture in Indonesia. So from That culture the must preserved so No extinct and always embedded inside soul Indonesian nation. That's great important exists learning at school about diversity in Indonesia.

Multiculturalism is something reflection and way think that be a place to improve human status with value difference in status similarities and differences. Conscious effort in embed multicultural attitude or tolerance to difference This called as multicultural learning (Ibrahim & Rustam, 2014).

One learning multicultural teaching to participant always teach see situation real they are facing is based on local wisdom. This can applied in all field study, as results study from site Nurhidayah (2022) that in face real problems and situations participant educate will the more challenged to face it and respond to it with attitude critical.

Adjustment process to mark local wisdom of multicultural learning in the era of society 5.0 in teaching and learning activities in the environment school Of course must be together with institutional stakeholder policies in arrange or designing curriculum multicultural learning with local wisdom that is appropriate in the era of smart society 5.0 and teacher skills or tendik in adapt self based on level school participant students, the material taught, and the right method in deliver (Wardati & dkk, 2023, p. 12).

If previously in the era of society 4.0, that is seek, retrieve, and analyze information or data in cyberspace via the internet. In the era of society 5.0 a number of information got from the sensors in the room physique Then accumulated in cyberspace. This can introduce diversity Indonesian culture in a way more wide as well as can be one way to preserve it so as not to is lost from civilization through education That alone .

Developments in the Revolutionary Era Industry 4.0 and Society 5.0 in determination Potency External Education

In the 21st century or the era of the Revolution Industry 4.0 and Society 5.0 emerge paradigm literacy new. According to study Hamidullah Ibda (2019), the challenges in this era are very complex which requires public implement literacy new (data literacy, literacy technology, literacy human) that becomes complementary old literacy (reading, writing, arithmetic).

In Meeting Ministry of Research and Technology National Work Higher Education 2018, Director General Learning and Student Affairs (Belmawa) Ministry of Research and Technology Dikti convey about a number of must ability owned by graduates A college high to face the era of the Revolution Industry 4.0. A must ability possessed and taught in the curriculum college the height of one of them is data literacy. In addition to data literacy, literacy new also requires literacy technology and HR.

The emergence of the era of literacy new No free from the revolutionary era industry 4.0. Condition this, is the era of the digital industry world has been become something paradigms and references in order life moment this. Revolution era Industry 4.0 is here together with the era of disruption since 2017 start responded Serious circles educated. To face revolution Industry 4.0 or the era of disruption literacy required new" apart old literacy. Existing old literature moment This used as capital to take part in life society. Data literacy, technology, and HR must responded education as high as you can entered to in learning (Ahmadi & Ibda, 2019, pp. 1-10).

According to study Hamidullah Ibda (2018), explained that strengthening literacy new to teachers and the world of education become important Because as key change, revitalization curriculum based literacy and reinforcement the role the teacher has digital competence. Teachers play a role build generation competent, character, possess ability literacy new, and skills think level high. Education as base determinant intelligence intellectual, spiritual, and emotional in children, must strengthen Skills literacy 21st century. Starting aspect creative, thinking critical, communicative, and collaborative. Urgent education strengthen literacy new and revitalized curriculum digital based. Revitalization curriculum refers to the five values base from participant good students, that is endurance, ability adaptability, integrity, competence, and improvement sustainable. Educator must being a digital guru, get it computer, and free from disease academic. The goal realize generation competent level height, character and literacy to answer Revolutionary challenges Industry 4.0 and Society 5.0.

In a book written by Farid Ahmadi and Hamidulloh Ibda mentioned that literacy new is ability or A business get information, knowledge, through three road that is data literacy, technology and human resources/ humanism. Literacy new become amplifier from old literacy ie calistung or known with read, write, count.

Learning process input with objectives in order to produce the desired output or outcome. For this reason, the application of HOTS (Higher Order Thinking Skills) is a must herding students and students can think logical, creative, communicative as required in the 21st century. Without matter that's achievement education to answer challenges in the revolutionary era Industry 4.0 is not will achieved, because in this era needed very complex skill. To answer challenges in this era so all teachers, lecturers, and academics, are required can realize matter That in framework reach civilization literacy new (Ahmadi & Ibda, 2019, pp. 37-43).

Educational Institutions have opportunity that must be implemented and strengthened in facing the era of revolution 4.0 and the era of society 5.0 through revitalization of the education system with strengthen the elements inside it good quality human resources, supporting infrastructure digitization, as well alignment integrated curriculum on five values base that is endurance, ability adaptability, integrity, competence, and improvement sustainable.

CONCLUSION

Based on objectives, results and discussion so conclusion article This is Presence revolution Industry 4.0 and 5.0 deliver contribution big to Indonesian education namely with create change and prepare excellent and innovative graduates with existing skills be prepared previously through revitalization of the education system with strengthen the elements inside

it good quality human resources, supporting infrastructure digitization, as well alignment integrated curriculum on five values base that is endurance, ability adaptability, integrity, competence, and improvement sustainable.

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