P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

EDUCATIONAL TRANSFORMATION IN THE ERA OF THE INDUSTRIAL REVOLUTION 4.0: CHALLENGES AND INTEGRATION OF LOCAL WISDOM

Gamal Abdul Natsir [1] , Samsudin [2] , Junaidin [2]
Sekolah Tinggi Ilmu Tarbiyah Sunan Giri Bima
mbokoringi@gmail.com

ABSTRACT

Revolution 4.0 has present transformation big in the world of education , both in method learning , system evaluation , as well as policy education . This study aim For analyze challenges and opportunities education in the era of the Industrial Revolution 4.0 and study the implications based on theories Study constructivism , humanism , and connectivism . Study methods This use approach descriptive-analytical through studies literature to various results study latest related integration technology and wisdom local in education . Study results show that transformation Education in the digital era requires teachers to have competence adaptive technology and pedagogy , temporary curriculum must oriented towards strengthening digital literacy , thinking critical , and learning based project . Integration of wisdom local become an important strategy For guard identity culture in the middle current globalization technology . Based on perspective theory learning , application technology in education in line with principle constructivism which emphasizes learning active and collaborative , theory humanistic which emphasizes development potential man in a way intact , and theory connectivism that highlights importance digital network as room learning new . Implications from study This confirm the need policy progressive education , strengthening digital competence of workforce educators , as well as design curriculum adaptive that combines values humanity , culture local , and innovation technology For realize system inclusive , character - based and empowering education global competitiveness .

Keywords: Industrial Revolution 4.0, Education, Local Wisdom , Learning Theory , Digitalization

INTRODUCTION

Revolution 4.0 has bring change significant in various sector life , including the world of education . Rapid digital transformation require system education For adapt with development technology to improve effectiveness and relevance learning in the modern era. Technology learning based constructivism be one of approaches that can optimized in system Islamic education to deal with challenge Industrial Revolution 4.0 (Khusnan, 2011) . Teachers in the 21st century must own digital competency for can face change paradigm in method teaching (Sonia, 2019) .

Change This No only impact on the method teaching , but also on demands skills that must be owned by participants educate . The Industrial Revolution 4.0 demands existence improvement digital literacy , thinking critical , and ability solution problem complex (Syerlita & Siagian, 2024) . Therefore that , curriculum education need experience innovation For ensure that graduate of own appropriate skills with need industry and job market .

In addition , the challenge main in the world of education in the era of the Industrial Revolution 4.0 is readiness power educators and infrastructure education . A studies highlight importance evaluation adaptive curriculum For accommodate development technology and global demands (Yanti et al., 2024) . Education must capable adapt with change technology without leave values the fundamentals .

On the other hand , integration wisdom local in education also becomes necessary aspects noticed in face Industrial Revolution 4.0. Wisdom local can made into as a strategy

P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

for adapt education with global change without lost identity culture (Kaliongga et al., 2023) . This matter show that transformation education No only involving adoption technology , but also how technology can contextualized in culture and values local .

Challenges and opportunities in Education in the era of the Industrial Revolution 4.0 is highly dependent on policy progressive education as well as readiness institution education in adopting innovative learning models (Iqbal et al., 2024) . More further , digital transformation in education open opportunity big for more learning flexible and based technology , such as utilization intelligence artificial intelligence and the Internet of Things (IoT) in the learning process (Najwa et al., 2024) .

Based on data from 2022 to in 2024, every the year the prevalence of stunting is increasing decreased . The government target decline stunting rate of 14%, this This is supported by the Participation Rate School (APS) Ages 7–12 Years by 99.19%. This is can seen in the following table :

Table 1. Child Development in Indonesia 2022 - 2024

Indicator	2022	2023	2024
Prevalence of Stunting	24.4%	21.6%	21.5%
Stunting Reduction Target	-	-	14%
Participation Rate School (APS) Ages 7–12 Years	99.16%	99.16%	99.19%
Number of Children Not Attending School (Ages 7-12 years)	2.5 million	-	-
Indonesian Media Survey Data : (Eve Candela F, 2024)			

However , in the middle development rapidly technology education , number child No go to school Still become issue serious , especially in the range ages 7-12 years . In 2022 , according to Media Indonesia survey recorded 2.5 million child No going to school . Phenomenon This show that although access to technology the more wide , still there is gap in implementation education digital- based , especially in the regions remote and less develop .

Research data latest show that Lots child No go to school Because factor economy , limitations access to infrastructure education , as well as lack of readiness power educator in adopt technology new . Therefore that , education strategy in face The Industrial Revolution 4.0 must take into account aspect inclusivity and accessibility , so that all over child get equal opportunity For get proper education .

With Thus , the Industrial Revolution 4.0 brings fundamental changes in the world of education , both from aspect method learning , demands competence , as well as policy education . Required effort collaborative between government , institutions education and society For ensure that system education can adapt with development of the times without lost essence in form empowered generation global competitiveness and character strong .

So from that , this writing will analyze impact Industrial Revolution 4.0 towards system education , including challenges and opportunities faced . In addition , the affirmation to urgency adaptation system education to development technology and industry to improve quality learning as well as identification factors that influence readiness education in facing the digital era.

METHODS

This study uses a qualitative approach with a descriptive-analytical library research method. This approach was chosen because the focus of the study is directed at an in-depth analysis of

P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

concepts, theories, and research results relevant to educational transformation in the era of the Industrial Revolution 4.0 and its implications for learning theory and the integration of local wisdom. This study was not conducted through field data collection, but through systematic searching and analysis of various scientific sources, both national and international, published between 2019 and 2024.

The research data sources consist of two categories, namely primary data and secondary data. Primary data includes academic books, reputable journal articles, and research reports discussing the topics of the Industrial Revolution 4.0, digital learning, constructivism, humanistic theory, and connectivism. Meanwhile, secondary data was obtained from government reports such as the Ministry of Communication and Information Technology (Kominfo), the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), UNESCO, and various online publications that support the research theme.

The data collection process was carried out through systematic literature review. Researchers first searched various academic references from databases such as Google Scholar, DOAJ, and Sinta to find relevant literature. Next, the sources were selected by considering the relevance of the theme, scientific reliability, and recency of publication. After the literature was collected, the researchers conducted a deep reading and thematic coding process, which involved grouping information based on main themes such as educational transformation, the challenges of digitization, the role of teachers, learning innovation, and the integration of local wisdom into the modern education system.

The collected data was then analyzed using the content analysis method developed by Krippendorff. The analysis process was carried out in three stages: first, data reduction, which involved selecting and simplifying important information from various literature; second, data presentation, which involved grouping the findings into categories that represent the theoretical and empirical dimensions of education in the era of the Industrial Revolution 4.0; and third, drawing conclusions, which involved formulating the relationship between learning theory and the challenges and opportunities of digital-based education.

To maintain the validity and objectivity of the findings, this study applied source and theory triangulation techniques. Each analysis result is compared and confirmed with learning theories and other relevant literature so that the resulting interpretation is not biased. With this approach, the study is expected to provide a comprehensive and applicable picture of how constructivism, humanism, and connectivism learning theories can be used as a conceptual basis in designing an adaptive, character-building, and contextual education system in the era of the Industrial Revolution.

RESULT AND DISCUSSION

Industrial Revolution 4.0 in Educational Context

Revolution 4.0 refers to the era of digital transformation which is characterized by with automation , intelligence artificial intelligence (AI), *Internet of Things (IoT), and* big data fundamental change method man work and interact with technology . Concept This introduced by Klaus Schwab who emphasized that The Fourth Industrial Revolution is continuation from revolution industry previously , but with integration system increasingly cyber - physical advanced (Schwab, 2019) .

In context education , the Industrial Revolution 4.0 brings impact big to method learning ,

ISLAMIC SCIENTIFIC JOURNAL
P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

curriculum , as well skills required by participants education and manpower educators . Paradigm learning based constructivism become more relevant in face challenges of this digital era , where participants educate sued For more active in build knowledge they Alone through technology (Khusnan, 2011) . Meanwhile that , highlighting importance digital competencies for 21st century teachers to adapt change in method based teaching technology .

Revolution 4.0 does not only influence technology learning but also demanding existence improvement digital literacy , thinking critical , and ability solution complex problems (Yanti et al., 2024) . Therefore that , education in this era need adapt the curriculum to be relevant with development industry and the job market . Education in the era of the Industrial Revolution 4.0 must Keep going evaluated to remain adaptive to change technology and global demands .

System education , including Islamic education , must capable adopt technology without lost values the fundamentals (Hadi et al., 2022) . In facing the change this , education No only must technology - focused but also necessary consider aspect wisdom local to remain relevant with values existing culture (Kaliongga et al., 2023) .

In a way In general , the Industrial Revolution 4.0 brings opportunities and challenges for the world of education . Readiness institution progressive education and policies become key main in facing this era . Digital transformation in education can increase flexibility learning and opening opportunity for approach based technology like intelligence artificial and IoT.

Therefore Therefore , education in the era of the Industrial Revolution 4.0 must put forward innovation in learning , improving readiness power educators , strengthening digital infrastructure , as well as adapt curriculum to be relevant with development technology and industry . Characteristics main thing that can found namely ; 1) automation of the education management system , 2) use of *Artificial Intelligence* in learning process , 3) use of big data in the evaluation process , 4) improving accessibility education through *Internet of Things* , 5) Digital Transformation in Education System, 6) Learning Based Technology , and 7) Integration of Local Wisdom with Technology .

Table 2. Technology in Education 2022-2024

Aspect	2022	2023	2024
Improvement Digital Infrastructure *(Ministry of Communication and Informatics of the Republic of Indonesia, 2024)*	Government start expand internet access to area remote through connectivity programs education .	Improvement amount schools that use fast internet network and digital learning platform .	221.56 million internet users , with average growth of 21% per year , supporting access digital education .
Automation System Educational Management *(Yogyakarta Special Region Education Quality Assurance Center, 2024)*	Implementation beginning system management learning digital - based in several school .	The adoption of Learning Management Systems (LMS) is increasing widespread in schools and colleges tall .	LMS is increasingly optimized with feature intelligence artificial For analysis performance student .
The use of Artificial Intelligence (AI) in Learning *(Yandri A., 2023)*	Trial of AI- based chatbots and tutors for help student in understand material .	AI starts implemented in system evaluation automatic and personalized learning .	AI is used in a way wide in adaptive learning and learning data analysis .
The Use of Big Data in Evaluation	School start collect academic data For analysis	Student data utilized For prediction results learning and	Integrated big data with system education national

P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

	development student .	intervention early .	For evaluation policy education .
Increase Educational Accessibility through IoT	The implementation of smart classrooms is limited in several school featured .	IoT starts used in system roll call automatic and management device learning .	IoT implemented more wide For increase efficiency learning and management school .
Digital Transformation in Education System	Digitalization teaching materials start implemented in a way gradually .	E-learning is increasingly popular in various level education .	Digital learning platforms are becoming standard main in the learning process teach .
Learning Based Technology	Use of learning videos and applications educative start increase .	The use of VR and AR for simulation learning interactive increase .	VR and AR technology is getting more and more popular . applied in various eye lesson .
Integration of Local Wisdom with Technology *(Innovative Teacher, 2024)*	A number of area start develop content learning based culture local .	Learning platform based culture the more develop .	Combination technology and wisdom local used in curriculum school digital - based .

This table describe development technology in education is increasingly rapidly every year , support more learning effective and inclusive . In Overall , the period 2022 to 2024 shows progress significant in optimization technology in education in Indonesia, with various initiatives aimed at increase quality and accessibility learning through innovation technology . With Thus , the characteristics main Industrial Revolution 4.0 in education covers automation , AI, big data, IoT, and demanding digital transformation readiness power educators and students in facing the technological era .

Educational Challenges in the Era of the Industrial Revolution 4.0

First , Change Skills Needs . Shift from skills conventional to digital skills in education is consequence from The Industrial Revolution 4.0 is changing method learning , demands skills and approaches evaluation academic . Paradigm learning based constructivism become more relevant Because participant educate pushed For build knowledge they Alone through technology (Khusnan , 2011) . Teachers must own digital competencies for adapt method teaching with development technology . This is seen in the more its area use *Learning Management System* (LMS) that replaces method traditional in management learning .

Revolution 4.0 demands improvement digital literacy , thinking critical , and ability solution problem complex (Syerlita & Siagian, 2024) . Therefore that , curriculum education must experience innovation so that graduates own appropriate skills with need digital industry . In the context data literacy , programming , and problem solving problem complex , data literacy becomes very important in system education Because its effectiveness in taking decision academic (Iqbal et al., 2024) . Schools and universities are starting utilizing student data For personalize experience Study they . Programming now become skills essentials that are mandatory owned students to be able to compete in the digital era (Jannah et al., 2023) . Some countries even has integrating coding and intelligence artificial in curriculum school Primary and secondary education . Results of a UNESCO survey conducted on May 4-19 , 2023, in 450 schools. and Universities in Africa, the

P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

Middle East, Asia, the Pacific , Europe , North America and Latin America show not enough from 10% of institutions education own policy institutional or formal guidelines regarding utilization technology AI- based (Refo, 2023) .

In addition , the Industrial Revolution 4.0 demands skills think critical and problem-solving, so that need curriculum based project and must start implemented For develop ability solution problem in a way collaborative . Education based technology also makes it possible student use simulation and intelligence artificial in finish real world challenges . With thus , the transition from skills conventional to digital skills as well improvement data literacy and programming become very important in system modern education . This step aims for students Ready face challenge digital industry and capable compete in environment increasing work digitized .

Second , the readiness of teaching staff . Lack of teacher training in technology education be one of constraint main in implementation learning digital -based in the era of the Industrial Revolution 4.0. Readiness power educators are very decisive effectiveness system education in adopt technology latest (Najwa et al., 2024) . Unfortunately , many teachers still do face limitations in matter digital skills because lack of training provided by the institution education and government . This is hinder the adaptation process they to method learning innovative based technology , such as use intelligence artificial intelligence (AI), *Internet of Things* (IoT), and deep big data evaluation education .

In addition , the challenge integration technology in method teaching also becomes problem big in many school . Digital transformation in education of course open opportunity big for more learning flexible , but Lots school Still face obstacle in its implementation (Iqbal et al., 2024) . The main obstacle that is often faced covering limitations infrastructure technology , lack of access to digital devices , as well as gap skills between power educators and participants educate in utilise technology in a way effective .

Third , Disparities in Access to Technology . Challenges other is disparity access technology that occurs between area urban and rural areas . Many schools are in remote areas Still own limitations in matter internet access , electricity , and devices technology supporters (Tahar et al., 2022) . As a result , integration technology in method teaching often only Can implemented in schools that have facility adequate . Therefore that , is necessary more policies progressive in increase capacity power educator through training sustainable technology as well as equality infrastructure education digital- based

Fourth , Challenge in Evaluation and System Assessment . Adaptation system evaluation to method learning based technology become A a necessity in the era of the Industrial Revolution 4.0. Along with development technology , systems previous assessment only based exam now start experience change going to a more approach interactive and based competence (Primayana , 2020) . Readiness institution education in adopting an assessment model based technology is very influential to effectiveness learning in the digital era. Technology intelligence artificial intelligence (AI) and big data are starting to implemented in evaluation academic For analyze development student in a way more deep , giving bait more back fast , and allows personalization learning .

In addition , it happened shift from evaluation based exam to evaluation based more competence emphasize skills practical and solution problem . Digital transformation in education open opportunity for method more assessment flexible , such as assessment- based projects and portfolios (Primayana , 2020) . Shift This aim For create system more assessment holistic and relevant with need industry as well as development of the times. With approach this , participants educate No only assessed based on results exam written , but also from ability they in think critical , innovative , and working in a way collaborative . Therefore that , the institution education must Keep going do evaluation to system assessment in order to be able to adapt with dynamics learning based technology , so that capable print more graduates Ready face global challenges in the digital era.

Digital Ethics and Security Challenges

al mubin
ISLAMIC SCIENTIFIC JOURNAL
P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

Student data security and privacy in digital learning becomes challenge main focus in the Industrial Revolution 4.0 era. Development technology in education demands teachers to more understand aspect security cyber to protect student data (Sonia, 2019) . The importance of evaluation curriculum in adapt policy protection privacy in the digital environment (Ashari et al., 2023) . In addition , UNESCO (2019) emphasized that intelligence artificial in education need strict regulations For ensure personal data security .

On the other hand , the impact negative technology , such as plagiarism and dependency to technology , also become attention main (Rahmawati, 2024) . Convenience access information in the digital era increases risk plagiarism among students . Dependence overuse of technology can reduce ability think critical and skills social student (Lestyaningrum et al., 2022) . Therefore that , education need integrate technology in a way wise with implant digital ethics and strengthen skills literacy information for participants educate capable utilise technology optimally without trapped in consequence negative .

Analysis and Implications of Education in the Industrial Revolution 4.0 Era Based on Learning Theory

This study intended For analyze How theories Study classic and modern can made into runway conceptual in understand as well as respond change system education in the era of the Industrial Revolution 4.0. Through approach constructivism , humanism , and connectivism , education No only viewed as a process of knowledge transfer , but also as activity build experience meaningful , contextual , and independence - oriented learning participant educate . The Industrial Revolution 4.0 is marked by progress digital technology , intelligence Artificial intelligence (AI), Internet of Things (IoT), and big data provide opportunity new for the world of education For create more learning interactive , collaborative , and adaptive .

Table 3. Analysis and Implications of Education in the Era of the Industrial Revolution 4.0

Learning Theory	Main Concepts of Theory	Analysis Implementation in Education in the Era of the Industrial Revolution 4.0	Implications to Education System
Constructivism (Piaget & Vygotsky)	Knowledge built through experience , interaction social , and reflection active .	Digital technologies such as LMS, VR, and AI make it possible student build his knowledge Alone through project-based learning and problem-based learning. Learning nature collaborative and interactive .	- Teachers play a role as facilitator , not center knowledge . - Learning nature exploratory and collaborative . - Curriculum based activities and technology .
Humanistic (Maslow & Rogers)	Learning participant - centered educate , emphasize actualization self and values humanity .	Integration of wisdom local in digital learning strengthens identity culture participant educate in the middle globalization . Motivation Study increase Because material relevant with life social and spiritual students .	- Education is directed at development potential whole (cognitive , affective , spiritual). - Content local developed in interactive digital form . - Digital ethics and character become focus main coaching .
Connectivism (Siemens &	Knowledge spread through	Utilization of IoT, Big Data, and social media	- Education is directed at learning based network (

ISLAMIC SCIENTIFIC JOURNAL
P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

Learning Theory	Main Concepts of Theory	Analysis Implementation in Education in the Era of the Industrial Revolution 4.0	Implications to Education System
Downes)	digital network ; learning happen through connection between sources and communities .	create network learning open . Participants educate can Study from various global sources through online platforms.	*networked learning*). - literacy and collaboration cross culture become competence main . - System learning flexible and adaptive to change technology .
Synthesis and General Implications		Revolution 4.0 strengthens relevance theory constructivism , humanism , and connectivism in a way integrated technology become a reinforcing medium independence learning and grades humanity .	- Curriculum design adaptive based technology . - Improvement digital competence of teachers. - Integration of values local and digital ethics in learning .

In perspective theory constructivism , learning based technology like *Learning Management System (LMS)* , *Virtual Reality (VR)* , and *Artificial Intelligence (AI)* allows participant educate build Alone his knowledge through experience live and digital collaboration . Participants educate No Again positioned as recipient information passive , but as subject active constructing meaning through activity exploratory and reflective . With Thus , education in the digital era requires teachers to play a role as facilitator who guides the learning process based project - *based learning* and problem solving problem (*problem-based learning*).

Temporary that , theory humanistic give base important for integration wisdom local in education digital- based . This theory emphasize that every individual own potential For develop in a way intact , good from side cognitive , affective , and spiritual. Therefore that , modern learning must still rooted in values culture and humanity so that technology No keep away participant educate from identity social . Content integration local to in digital platforms no only strengthen character participant educate , but also create meaningful and relevant learning with life they .

Next , the theory connectivism become framework think very relevant new with characteristics digital education . In theory this is the learning process happen through network that connects participant educate with various source global knowledge . Technology such as IoT, big data, and social media allows student For Study from various sources and collaboration cross geographical boundaries as well as culture . This is show that knowledge in the digital era is dynamic , distributed , and continuous develop through interaction social and online collaboration .

Based on third approach theory said , can concluded that transformation education in the era of the Industrial Revolution 4.0 must directed at an adaptive , integrative , and development - oriented learning model character . The implication is that the design curriculum need arranged with combine principle digital technology , values humanity , and context culture local . Teachers must transform become facilitator learning that encourages independence , thinking critical , and digital literacy of participants educate . With integration theory Study this , system education will capable give birth to generation that does not only superior in mastery technology , but also has identity , morality , and sensitivity strong social in face global challenges .

al mubin
ISLAMIC SCIENTIFIC JOURNAL
P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

CONCLUSION

Revolution 4.0 has bring change big in the world of education , demanding system more learning based technology . Challenges main issues faced covering shift need skills from conventional to digital, readiness power educator in adopt technology , as well as disparity access education digital -based between area urban and rural areas . In addition , the system evaluation also experienced change with emphasizes competence and problem solving problem based technology , not just exam written . Challenge other is problem digital ethics and security , including student data protection , privacy in digital learning , as well as risk plagiarism and dependency excessive to technology .

In facing the challenge mentioned , it is necessary close synergy between government , schools , and industry . Government play a role in provide policy progressive education , improving digital infrastructure , as well as ensure power educator get training adequate technology . Schools and institutions education must adopt method learning innovative , updating curriculum to be relevant with development industry , as well as implant digital ethics to participant educate . Meanwhile that , industry can bridging the world of education and the world of work through internship programs , training based industry , as well as support research and innovation education based technology . With existence synergy this , it is hoped system education become more adaptive and innovative in answer challenges of the digital era. Education based on technology must still balanced with strengthening character and values culture local so as not to lost essence in form superior generation . In addition , the system inclusive and future - oriented learning will ensure that participant educate Ready facing an increasingly busy world of work digitalized and competitive .

BIBLIOGRAPHY

Ashari, MK, Athoillah, S., & Faizin, M. (2023). Application-Based E-Assessment Model in Senior High Schools in the Digital Era: Systematic Literature Review. *TA'DIBUNA: Journal of Islamic Religious Education* , *6* (2), 132–150.

Yogyakarta Special Region Education Quality Assurance Center. (2024, September 19). *Optimizing Artificial Intelligence for Learning Innovation in the Digital Era – Yogyakarta Special Region Education Quality Assurance Center* .

Eve Candela F. (2024, July 23). *National Children's Day 2024, Here are 7 Problems in the World of Children in Indonesia* .

Innovative Teachers. (2024, November 19). *Optimizing Technology and Local Culture to Support Educational Transformation* .

Hadi, A., Mukhlis, I., Oline, G., & Azizah, N. (2022). Islamic Education and Challenges in the Era of the Industrial Revolution 4.0. *Reforma: Journal of Education and Learning* , *11* (1), 30–41.

Iqbal, I., Suryana, N., & Fahrizal, F. (2024). Potential and Challenges of Learning in the Industrial Era 4.0 in the World of Education. *Dharmas Education Journal (DE_Journal)* , *5* (2), 1445–1451.

Jannah, M., Shafika, N., Parsetyo, E. B., & Habib, S. (2023). Digital Transformation in Islamic Education Management: Opportunities and Challenges. *Darussalam Islamic Education Management Journal (JMPID)* , *5* (1), 131–140.

Kaliongga, A., Iriani, A., & Mawardi, M. (2023). Reintegration and Contextualization of Sintuwu Maroso Local Wisdom: Efforts to Answer Educational Challenges in the Era of the Industrial Revolution 4.0 Towards Society 5.0. *Scholaria: Journal of Education and Culture* , *13* (2), 117–127.

Ministry of Communication and Informatics of the Republic of Indonesia. (2024). *A Decade of*

ISLAMIC SCIENTIFIC JOURNAL
P-ISSN: 2746-8240 E-ISSN: 2746-5535
DOI: https://doi.org/10.51192/almubin.v9i1.2275

Indonesian Digital Development 2014-2024 . PT Sarana Ecommerce Nusantara.

Khusnan, A. (2011). Islamic Religious Education (PAI) Learning Technology in the Constructivist Paradigm. *Fikroh: Journal of Islamic Thought and Education* , *4* (2), 154–167.

Lestyaningrum, IKM, Trisiana, A., Safitri, DA, & Pratama, AY (2022). *Digital technology-based global education in the millennial era* . Unisri Press.

Najwa, PZ, Islamiyah, T., & Yasin, M. (2024). Dynamics of the Sociological Foundations of Education in the Digital Era: Challenges and Opportunities. *Journal of Educational Development and Research* , *6* (3).

Primayana, KH (2020). Early Childhood Education Learning Planning in Facing the Challenges of the Industrial Revolution 4.0. *Proceedings of the Dharma Acarya National Seminar* , *1* (3), 321–328.

Rahmawati, V. (2024). Analysis of SMA Negeri 1 Sei Rampah Library Policy on Copyright to Prevent the Risk of Plagiarism. *Literatify: Trends in Library Developments* .

REFO. (2023, July 28). Artificial Intelligence (AI): Ethics and Its Implementation in Education. *REFO* .

Schwab, K. (2019). *The Fourth Industrial Revolution* . Gramedia Pustaka Utama.

Sonia, TN (2019). *Becoming a 21st Century Teacher: Answering the Learning Challenges of the Industrial Revolution 4.0* .

Syerlita, R., & Siagian, I. (2024). The Impact of the Development of the Industrial Revolution 4.0 on Education in the Current Era of Globalization. *Journal on Education* , *7* (1), 3507–3515.

Tahar, A., Setiadi, PB, & Rahayu, S. (2022). Human resource development strategies in facing the era of the industrial revolution 4.0 towards the era of society 5.0. *Tambusai Education Journal* , *6* (2), 12380–12394.

Yandri A. (2023, October). *Digitalization of Education Drives Increased Competitiveness—Directorate of Elementary Education Teachers* .

Yanti, D., Prastawa, S., Utomo, W.F., Wiliyanti, V., & Utomo, B. (2024). Education in the Industrial Revolution 4.0: A Case Study of Independent Curriculum Evaluation in Indonesia. *Edu Cendikia: Scientific Journal of Education* , *4* (02), 380–390.