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Digitalization of Education

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Abstract

Currently, the digitization of education is nothing new. The idea of digitization of education is accepted at almost all levels of learning, from kindergarten to higher education institutions. This idea is the transformation of the education system in Malaysia, which aims to create a line of educators and students who are creative, innovative, efficient, and enthusiastic in line with the needs of the times and also in line with the wishes of the Industrial Revolution 4.0. The digitization of education is critical to the Malaysian Ministry of Education, educators, and the community in order to keep pace with current technological developments. However, several gaps in the digitization of education have been identified related to knowledge, physical, economic, and social factors. Therefore, the Malaysian government through the Malaysian Ministry of Education, Government-Linked Companies (GLCs), and Government-Linked Investment Companies (GLICs) have collaborated to bridge the gap through several initiatives involving the Malaysian Family Digital Economy Centre (PEDi), National Digital Linkage Plan (JENDELA), CERDIK, BSN MyRinggit-I COMSIS Scheme funding, and Student Devices. Therefore, it can be concluded that although there are still issues with its implementation, educational pedagogy has become better with the digitization of education. Teachers and students who are digitally fluent and able to compete according to current needs are born in line with the development of Industrial Revolution 4.0. financing of BSN MyRinggit-I COMSIS Scheme and PerantiSiwa. Therefore, it can be concluded that although there are still issues with its implementation, educational pedagogy has become better with the digitization of education. Teachers and students who are digitally fluent and able to compete according to current needs are born in line with the development of Industrial Revolution 4.0. financing of BSN MyRinggit-I COMSIS Scheme and PerantiSiwa. Therefore, it can be concluded that although there are still issues with its implementation, educational pedagogy has become better with the digitization of education. Teachers and students who are digitally fluent and able to compete according to current needs are born in line with the development of Industrial Revolution 4.0.

Keywords: Digitization of Education, Educational Gap, Factor, Equality, Government Initiative

Introduction

The implementation of the Digital Education Policy is a government effort to empower the digital economy. This policy is a step taken by the government to provide a digitally literate generation that can boost the quality of the country's education and become the best in the world. The three main objectives of the Digital Education Policy are 1) providing a digitally literate generation, 2) improving the competence and professional development of

stakeholders, and 3) bridging the digital divide. With the development of the use of Information and Communication Technology (ICT) in Education, has changed from the conventional teaching and learning system to E-Learning (Electronic Learning) and then M-Learning (Mobile Learning). The interactive materials applied in teaching and learning system include Interactive CDs, music, videos, Websites, and educational applications that can be accessed through smartphones and tablets can attract attention and increase students' understanding of a subject. Accordingly, teachers need to constantly explore and update their digital education knowledge to be more advanced than school students.

ICT-Based Learning

Since 2014, the Malaysian Ministry of Education (MOE) has introduced ICT-based learning. Training and courses have been given to teachers to handle computer hardware and related applications. Using the internet and technology will also improve students' skills in computers and networks. In addition, students can communicate with other students regardless of national borders to improve their communication skills. However, the challenges teachers must deal with in the face of digital education still need attention. Among the challenges teachers face is the low level of student readiness for digital education due to the lack of digital infrastructure facilities, lack of skills in handling computer applications, and constraints to access the internet. Therefore, the government's efforts through the MOE to improve the digital infrastructure are very appropriate to ensure that every layer of society can enjoy the success of digital education.

In line with the development of technology, various learning styles and methods can be applied by teachers using MOE materials that can be accessed via the Internet. The application will also give birth to a generation that thinks creatively and critically. This is because digital learning aims to encourage the active involvement of students to achieve the learning objectives set. Nevertheless, the gap in the implementation of digital education has an unhealthy effect and affects student performance in studies. If this digital gap problem is not overcome immediately, it will cause efforts to produce digitally literate students to be stunted. The fact is that access to the internet alone is not enough. Teachers and students need digital skills in applying digital education in MOE.

The Importance of Digitization of Education

MOE has created a healthy phenomenon for teaching and learning researchers to highlight the study of technology use in teaching and learning in line with the development of technology that has no boundaries and limitations. The importance of digital education elements in reality and academics is emphasized to keep pace with current technological developments.

Importance to the Malaysian Ministry of Education

The Ministry of Education has formulated a digital education policy with the aim of producing a digitally literate and competitive generation. Jidin (2021) stated that the digital education policy that was drafted is to cultivate digital talents who are knowledgeable, skilled, and ethical in the use of digital technology. The digital education policy framework focuses on improving students' mastery of digital technology, enriching quality digital content, empowering teacher competence, and cultivating the use of digital technology among Education leaders. MOE also always emphasizes the use of digital technology in the implementation of teaching and learning. The Continuous Professionalism Development Plan

(PPB) and the Teacher Professionalism Development Master Plan have been re-adjusted to strengthen the knowledge, skills, and attitudes of teachers towards the learning challenges of the 21st century. Technology-based courses for teaching and learning and digital innovation in teaching and learning are among the courses that prospective teachers are required to study at the Teacher Education Institute. These courses enable them to produce quality digital materials as well as gain exposure to manage teaching and learning resources and media efficiently to help the teaching and learning process at school.

MOE's ICT Transformation Plan (2019-2023) provides a robust ICT infrastructure to address the issue of applying digital in education and support the environment for the application of new materials in education. ICT infrastructure is defined as the main components, including data networks, data centres, ICT security, servers, and data storage. Among the strategic themes proposed in the KPM ICT Transformation Plan (2019-2023) related to ICT infrastructure is Strategic Theme A: Optimal network and line infrastructure to support educational institutions, all departments, and agencies under the MOE. The strategy under Strategic Theme A is to improve Internet connectivity in schools using various Internet Service Providers as well as expand the Local Area Network, LAN) in schools to improve the limited network facilities in computer labs to the use of wireless connections. Accordingly, this transformation will change the landscape of national education to keep pace with the rapid development of the Malaysian economy.

Although the development of technology that has no limits and boundaries is often associated with a negative impact, the encouragement of the use of technology in education is a healthy phenomenon among teaching and learning researchers. The integration of digital games into the learning environment has resulted in a learning method known as digital game-based learning. Ham et al (2021) stated that using digital games in teaching and learning will attract students' interest in learning. The positive effects of the digitization of education will be more evident if educational leaders have the skills to influence, encourage, guide, direct, and mobilize organizations related to the implementation and development of education and teaching in the digital era.

Importance of teachers

In the digitization of education, improving and empowering teachers' skills is one of the most important things in ensuring quality education is delivered to students. Teachers need to show seriousness and equip themselves with various knowledge and skills and have a high level of commitment in implementing efforts to improve the quality of the students that will be produced, and always be ready to shoulder the increasing workload. Digitization of education is important for teachers because a teacher needs to lead and collaborate in a change in school. Teachers will also be able to ensure that students are digitally competent to face the job market in accordance with Industrial Revolution 4.0. Teachers with digital skills can provide appropriate materials according to student's proficiency levels and needs. Teachers can also use learning materials repeatedly and take advantage of various resources interactively to improve the student's learning experience by expanding teaching materials beyond standard textbooks.

Interest to Society

The empowerment of digital communication or the internet is important, especially for rural communities still facing internet access and ownership problems. According to Kofi Annan, who is the former Secretary General of the United Nations: "Information and Communication

Technology is not a panacea or a magic formula, but both can improve the lives of all people on this planet". In connection with that, the government has strengthened initiatives to address the digital divide between communities. For example, the National Digital Interconnection Plan (JENDELA) has been empowered by developing digital infrastructure for which RM 21 billion has been allocated to strengthen the implementation of JENDELA [11]. JENDELA's focus includes education and productivity, business, government, and industry-based services, community and society.

Factors Affecting the Education Digitalization Gap

Nowadays, ICT needs are a basic need for students' lives. However, some factors affect the educational digitalization gap, including knowledge, physical, economic, and social.

Knowledge Factor

Knowledge of ICT is very important in the development of the industry towards Industrial Revolution 4.0. ICT knowledge is also important in carrying out daily activities. Nur Syawal Syazwani and Norfatiha (2022) stated in their study that a person who does not know how to use technology would have trouble adapting to things that require skills in handling new technology. Accordingly, if educators and students do not have the knowledge to handle ICT-related matters, teaching and learning sessions will be difficult to implement.

Physical Factors

The physical factors that create the digitalization gap in education are demographic factors and the need for digital devices. Demography is one of the factors that the responsible parties cannot contain. Urban and rural residential locations create a digitalization gap in education. Students who live in rural areas have the potential to drop out of school. This is because their locality where it is difficult to get an internet network can cause them to lose focus and lack motivation. Internet network problems will also make it difficult for students to understand the subjects being taught and make it difficult for them to complete the assignments given by the teacher compared to students with good internet coverage. In addition, the factor of digital devices is also a gap in the digitization of Education. This is because not all parents are able to provide digital devices and internet needs for their children to study. This constraint exists among B40 parents whose income is only enough to meet their daily needs.

Economic Factors

Economic factors are among the factors that cause the B40 and M40 communities to be affected in providing their children with devices and internet access. The B40 community has a household income below RM 4,360 while the M40 community has a household income between RM 4,360 and RM 9,619. Although the household's income is high, today's increasingly high economic standard has caused the B40 and M40 communities to be increasingly affected due to the Covid-19 pandemic that hit in 2020. Some communities have changed their status from B40 to M40 following the pandemic. As such, it is a problem for this family to provide digital devices such as laptops and computers and purchase internet data because their priority is to buy daily necessities. Márquez et al (2020) stated that the narrowness of life experienced by these two groups would have an impact on students' learning needs.

Social Factors

Social support is needed by students when facing difficulties in teaching and learning. Support may be needed from family members, teachers, and peers. Social support may also be needed from governmental and non-governmental bodies, such as counsellors that can help reduce emotional stress and depression. Motivated students will obtain good learning results and can stimulate interest in learning. On the other hand, a lack of motivation and moral support will cause the spirit of learning to decrease and affect student performance. Accordingly, the digitization of education should not be taken lightly because if digital needs are not met, it may cause students to be exposed to emotional stress and depression.

Education Digital Initiatives and Policy

Equality is the main goal in ensuring the harmony and stability of the country. Equality in a country is that every group regardless of race, ethnicity, and religion can enjoy the country's wealth fairly and equitably. Education in Malaysia is one of the topics that is often discussed based on the aspect of equality. The Malaysian Ministry of Education has responded to the call for the principle of Education for All (EFA) by The United Nations Educational, Scientific and Cultural Organization (UNESCO). The Malaysian Ministry of Education's policy under the 4th Core of the Education Development Master Plan (PIPP) is to bridge the gap in Education between all groups by considering the location, socioeconomic level, and student ability level (MOE, 2009).

Malaysian Family Digital Economy Centre (PEDi)

Through the Malaysian Family Initiative which established the Malaysian Family Digital Economy Center (PEDi), the economic gap between urban and rural areas is reduced by expanding the digital network. The Malaysian government undertakes this initiative to help Malaysian families take full advantage of digital technology in improving a family's socioeconomic status. PEDi is also a specific government initiative in bridging the digitalization gap at the rural, community, and low-income levels.

National Digital Interconnection Plan (JENDELA)

The government has developed several initiatives to bridge and reduce the digital divide in Education involving B40 students. Among the initiatives developed is the National Digital Interconnection Plan (JENDELA) as the core of developing a digital infrastructure that makes Malaysia a more globally competitive, robust, resilient, and digital-based society. Under the 12th Malaysia Plan (2021 - 2025), JENDELA will be a platform for improving the country's digital communication. The government is also actively trying to overcome the coverage problem in cities, suburbs, and rural areas through construction projects and improving infrastructure. JENDELA will impact 4G coverage and increase the average 4G speed from 25Mbps to 30Mbps. Ease of accessing the internet in the city.

Intelligent

CERDIK is one of the initiatives of Government Linked Companies (GLCs) and Government Linked Investment Companies (GLICs) involved in the mission of bridging the digital divide by providing digital access to low-income students, such as laptops, tablets, and data connections. CERDIK aims to bridge the digital learning gap of students throughout Malaysia for the future use of digital learning models. Among the objectives of CERDIK is to provide devices, access, and data connection to marginalized school students and bridge the learning

gap between those who can afford devices and those who cannot. CERDIK is a long-term national initiative for use now and for use in the future.

Funding of BSN MyRinggit-I COMSIS Scheme

Apart from that, the government and Bank Simpanan Nasional (BSN) have established cooperation by providing RM 100 million to finance the BSN MyRinggit-I COMSIS Scheme. It is a laptop loan scheme for students of higher education institutions who get loans from the National Higher Education Fund Corporation (PTPTN). The Ministry of Higher Education (MOHE) has the best deals from plan and device suppliers. The Data and Device Plan Package initiative for B40 group IPT students is one of KPT's efforts to obtain equal education without the gap between urban and rural areas. This initiative is very helpful for students who cannot afford the high cost of subscribing to existing data plan packages.

Student Devices

Another initiative implemented by the government to bridge the digital divide is the supply of tablets under the PerantiSiswa initiative. This initiative is under Budget 2022, led by the Ministry of Communications and Multimedia Malaysia (K-KOMM) with the cooperation of the Ministry of Finance (MOF) and the Ministry of Higher Education. The government's concern is for B40 students to form a digital community and bridge the digital gap between communities. In addition, the provision of this Student Device ensures that the learning process of B40 students at IPT continues to be maintained.

Suggestions for Improvement

MOE has launched the MOE Perkasaku program in September 2021 until February 2022 to restore education. However, this effort cannot be proven effective in increasing student dropout rates because the level of teaching and learning achievement is moderate.

Country

Ahmad (2022) lists the challenges of education for the endemic phase that slows down the development of education into the future, Malaysia also needs to organize the national education system with various reforms in the way and new culture of education with various innovations and digitalization. Malaysia should follow the example of Singapore, Taiwan, Japan, and South Korea who were found to be successful in restoring their education systems quickly throughdigital-based education that aligns with the development of Industrial Revolution 4.0 and produces a digitally literate generation.

Ministry of Education Malaysia

The efforts that have been carried out show that the government is concerned about the welfare of the people. According to Susanto (2018) in the context of learning, the highest level of need is self-achievement realized through learning achievement. Basic needs must be given attention first to improve student achievement in learning where physiological needs, safety, love, and recognition are needed so that students can optimize their potential. To reduce academic procrastination among students, the needs that have not been met should be given attention. The study of Susanto et al (2018); Fatimah (2018) have the same opinion regarding Maslow's Theory, which is that humans have an innate desire to fulfil themselves, to be what they want. They can pursue their goals autonomously if they are in the right environment. In addition, MOE also needs to pay attention to the maintenance of digital devices given to

students where the devices are not only given on a one-off basis but need to be maintained regularly, and the software used is the latest.

Teacher Readiness

Improving teacher skills is one of the most important things in ensuring quality education. Therefore, MOE needs to establish more collaborations with GLCs or GLICs to improve training related to digitization. The expertise of these two bodies will assist teachers in mastering applications and devices related to digital technology.

Community Readiness

The M40 group also needs to be given attention in efforts to reduce the digital divide because this group is also one of those affected by the Covid-19 pandemic that hit the world starting in 2020. The impact of the pandemic does not consider educational and career backgrounds. Therefore, continuous efforts from various parties are very important to narrow the digital gap of every community group so that no more dropouts in learning occur.

Conclusion

In conclusion, every group needs to be ready to face the transformation of digital education. The conventional learning system has changed to digital technology in preparation for entering the global work world, which has also undergone digital transformation on a large scale. It is also in line with the mission of the Malaysian Education Development Plan (2013-2025), which is the wider use of digital technology in the school ecosystem, including teaching and learning. This transformation will also change the national education landscape. MOE and related ministries must always work together in dealing with the issue of the B40 group by considering the gap between devices and learning space so that it does not become a constraint for students to continue their studies. The M40 group also needs to be given attention in terms of the digital divide because this group is also one of those affected by the Covid-19 pandemic. The impact of this pandemic does not count on educational and career background. In addition, Industrial Revolution 4.0 shows the dependence of the industry and the work environment on Cyber Physical Systems (CPS) and their implementation in smart factories that require readiness, including efficiency skills to meet the needs of the industry. Future employees will need to have a high skill level in using various CPS-based technological advances that are clearly very different from the industry's current state [19]. Therefore, continuous efforts from various parties are very important to narrow the digital gap for every society group so that there is no more learning dropout. The impact of this pandemic does not count on educational and career background. In addition, Industrial Revolution 4.0 shows the dependence of the industry and the work environment on Cyber Physical Systems (CPS) and their implementation in smart factories that require readiness, including efficiency skills to meet the needs of the industry [18]. Future employees will need to have a high skill level in using various CPS-based technological advances that are clearly very different from the industry's current state [19]. Therefore, continuous efforts from various parties are very important to narrow the digital gap for every society group so that there is no more learning dropout. The impact of this pandemic does not count on educational and career background. In addition, Industrial Revolution 4.0 shows the dependence of the industry and the work environment on Cyber Physical Systems (CPS) and their implementation in smart factories that require readiness, including efficiency skills to meet the needs of the industry. Future employees will need to have a high skill level in using various CPS-based technological

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