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Research Article

Implementation Of A Holistic-Comprehensive Education Program On Student Readiness To Face The Era Of The Industrial Revolution 4.0

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ABSTRACT

This study seeks to investigate the concept of comprehensive education in the context of the Fourth Industrial Revolution. The research methodology employed is literature analysis. Findings reveal that comprehensive education is grounded on the belief that students can achieve excellence by embracing all aspects of themselves through self-actualization. Comprehensive education also involves learning through inquiry, where students are accountable for facilitating learning through questioning exploration. Previous studies have underscored the prevalence of anxiety and stress among students in the Fourth Industrial Revolution era, indicating a rise in social issues, academic stress, and mental health challenges. In conclusion, comprehensive education can serve as a remedy to enhance students' self-efficacy and tackle the mental health issues encountered in the age of technology and the demand for specific skills.

Keywords: Comprehensive Holistic Education, Student Readiness, Fourth Industrial Revolution Era

INTRODUCTION

Currently, the world has entered the era of the 4th industrial revolution, characterized by increased connectivity and interaction, as well as the development of digital systems, artificial intelligence, and virtual reality. This shift in revolution affects all aspects of human life, from behavior to the use of communication tools, and technology-based education (Lase, 2019; Lasi et al., 2014; Wagner et al., 2017). The changes in this era are inevitable, therefore adequate human resources preparation is needed to adapt and compete on a global scale, as well as to understand technology holistically (Lewin & McNicol, 2015; Mayes et al., 2015). Improving the quality of human resources through education, from basic and secondary education to higher education, becomes the key to keeping up with the development of the 4th Industrial Revolution.

The global education system is swiftly evolving alongside rapid technological changes, necessitating careful preparation to meet the learning expectations of the digital native generation in the 21st century. This era is marked by collaborative acceleration in technology and information access (Faheem et al., 2018). The idea of the Fourth Industrial Revolution was initially presented by Klaus Schwab in his book, The Fourth Industrial Revolution, which highlights how this revolution can fundamentally alter our way of life, work, and interactions. Based on research conducted by several researchers, Industry 4.0 offers a number of benefits and also presents several challenges that need to be overcome. A study by Cimini et al. (2017) highlights the importance of data security as a key factor in implementing Industry 4.0. The lack of leadership skills, as emphasized by Basl (2017), is also a barrier that needs to be addressed in adopting the latest technology. In addition, organizational conflicts (Kiel et al., 2017), and risks associated with new products and services, as identified by Pereira & Romero (2017), are also major challenges in adopting Industry 4.0. Internal conflicts can hinder the necessary changes to move towards the latest technology, while risks associated with new products and services can threaten the success of implementation.

However, the Industry 4.0 also brings great potential benefits to organizations. Some studies, such as the one conducted by Paritala et al. (2017), indicate that the latest technology can help in waste reduction and resource efficiency. Additionally, research by de Sousa Jabbour et al. (2018) reveals that environmentally friendly technology can support eco-friendly manufacturing. A study by Kiel et al. (2017) highlights cost savings that

can be achieved through the implementation of Industry 4.0. Furthermore, Industry 4.0 also enables organizations to make quick decisions based on real-time data (Cimini et al., 2017). This can result in more efficient production scheduling, better utilization of competencies, and significant energy savings.

Understanding students' characteristics is crucial for teachers in planning their teaching. The theory of learning psychology identifies four main needs of students: the need for competence, autonomy, relatedness, and continuous learning (Satori et al., 2019). Students need to feel capable and successful, which can be supported by teachers through clear instructions, achievable goals, and constructive feedback (Maya et al., 2021). They also need the freedom to learn independently and make choices, such as choosing topics or projects. This can be achieved by giving students opportunities to learn autonomously and take control of their learning (Maya et al., 2021; Rentzelas & Harrison, 2020). Additionally, students need to feel connected to others and have positive relationships. Teachers can create an inclusive environment, encourage collaboration, and provide opportunities for social interaction (Maya et al., 2021). Meaningful, engaging, and relevant learning is the key. Teachers can achieve this by using a variety of teaching strategies, connecting lessons to the real world, and providing hands-on learning experiences (Maya et al., 2021). All of these help teachers meet students' needs and make learning more effective (Panjaitan et al., 2022).

In the age of the fourth industrial revolution, educational institutions need to be cautious about the emerging learning trends among students. There are 9 trends to consider, such as the ability to learn anywhere and anytime, personalized and individualized education, students having the freedom to choose their desired field of study, and a preference for project-based learning and experiential learning (Satori et al., 2019). With the advancements in digital technology, the learning process is no longer confined to a specific time or place. This opens up opportunities for distance learning and other flexible educational models. Since students have different learning styles and preferences, educators can tailor their teaching methods to better cater to each student's needs (Abdelhadi et al., 2019). Project-based learning and hands-on experiences can greatly assist students in developing critical thinking, problem-solving, and collaboration skills (Hermansyah et al., 2021).

In line with this, Srivani et al. (2022) mention that the Education 4.0 approach is believed to encourage innovative and intelligent behavior in education, which can have a positive impact on student learning and psychology. Students have a positive understanding of integrating Education 4.0 for sustainable technology development. They have a good perception of readiness in integrating Education 4.0, the impact of technological facilities, and enhancing digital skills for employability. This positive perception can contribute to the success of implementing Education 4.0. (Halili & Sulaiman, 2021). In the study by Yandri et al. (2021), the implementation of the STIFIn approach aims to map students' intelligence according to the human brain, which consists of thinking senses, intuition, feelings, and instincts. This method helps students determine their career path for optimal productivity, as they are required to upgrade their abilities according to their talents and intelligence in the era of the 4.0 industrial revolution.

LITERATURE REVIEW

The research conducted by Rahmatullah et al. (2022) reveals that the advancement of technology and increasing connectivity has made it easier for students in the learning process. Moreover, the digital era 4.0 also enables students to quickly familiarize themselves with advanced technology, allowing them to adapt more effectively to technological developments in society. This era also provides a more interactive learning experience and allows students to access educational resources more easily. Additionally, students are taught to adapt to the continuous changes that occur in the digitalization era.

Numerous studies have shed light on the prevalence of anxiety and stress among students in the era of the 4.0 Industrial Revolution. Bayram & Bilgel (2008) have shared concerning statistics regarding the high rates of depression, anxiety, and stress symptoms among Turkish students. Putwain (2007) has explored methodological aspects when studying academic stress and anxiety in students. Overall, research shows that the 4.0 Industrial Revolution has led to a rise in social problems, academic stress, and mental health challenges for students.

The rise of new technologies and the need for specialized skills may result in feelings of incompetence or mismatch in the chosen field. Liventsova et al. (2018) highlight the necessity of interdisciplinary competencies in the digital society. Federova (2008) talks about the significance of students adapting to professional activities and their competency levels. Porter & Phelps (2014) suggest an integrative approach to preparing doctoral students for various careers, focusing on aligning students' research with their future career objectives. Porter & Phelps (2014) discovered that younger individuals with lower self-efficacy in information seeking are more vulnerable to information overload. Chen et al. (2011) identified various factors contributing to information overload in online learning, including inadequate prior knowledge, language skills, technical skills, and learning preferences. Whelan & Teigland (2011) highlight the role of human filters in managing information overload within organizations, while Daradkeh et al. (2015) discuss the challenges of finding relevant information amidst the abundance of available data and proposed solutions such as filtering, knowledge investment, and information literacy.

Students face difficulties in staying motivated in the face of constant change and the need for lifelong learning. Martin (2012) emphasizes the importance of understanding lifelong learning perseverance and calls for qualitative research to provide contextual explanations about motivation. Dennen & Bonk (2006) highlight the

challenges in motivating online learners and the need for effective online tools and pedagogy. Ng (2016) focuses on procrastination and self-regulation in diverse learner profiles, aiming to cultivate intrinsic motivation in academic learning. Dunlap & Lowenthal (2013) discuss the potential of Web 2.0 technology to support lifelong learning skill development. Collectively, these perspectives highlight the complex nature of motivation in the era of 4.0 and the need for effective strategies to keep students motivated in the face of constant change and the demands of lifelong learning.

The increasing reliance on technology for learning and work can lead to feelings of social isolation among students. Fallahi (2011) found that students addicted to the internet experience higher levels of social isolation. Mahmud et al. (2018) discovered that although students prefer face-to-face interaction, they rely on social media for the ability to portray themselves differently and less shyly. Weiwei et al. (2021) highlight vocational school students' dependence on phones and how it can contribute to loneliness. Yayan et al. (2019) found that young individuals addicted to the internet and phones have higher levels of loneliness and poorer social relationships. Overall, these studies provide evidence that excessive technology use can have a negative impact on students' social relationships and contribute to feelings of social isolation.

METHODOLOGY

Research methods suitable for studying the implementation of a comprehensive holistic education program on students' readiness to face the era of the 4.0 industrial revolution can encompass various approaches. Initially, a literature review will be conducted to conduct an in-depth analysis of relevant literature on holistic education, the 4.0 industrial revolution, and students' readiness to adapt to technological changes. Both quantitative and qualitative data analysis will be utilized to process the collected data and identify patterns, trends, and relevant findings related to students' preparedness for the era of the 4.0 industrial revolution. By integrating these approaches, the research is expected to provide a comprehensive understanding of the impact of a comprehensive holistic education program on students' readiness to adapt to technological changes.

RESULTS AND DISCUSSION

Throughout history, there has been a long-standing tradition of moral and character education that has undergone significant changes over time. Essentially, holistic education is based on the belief that students can achieve greatness by embracing all aspects of themselves through self-actualization. As such, holistic education emphasizes the development of spiritual, intellectual, creative, emotional, artistic, social, and physical potential (Spier et al., 2018). The philosophy of holistic education is rooted in the ideas of ultimacy and wise competence (Forbes & Martin, 2004). The concept of ultimacy is related to enlightenment (spirituality). In holistic education, spirituality emphasizes the interconnectedness of all living beings and harmony. The psychological aspect of ultimacy is based on self-actualization, where in holistic education, all students are encouraged to be their best, striving for the highest aspirations.

Comprehensive holistic education strives to bridge the gap between different areas of knowledge and assist students in gaining a broader perspective. This integration can be accomplished through interdisciplinary projects, thematic units, or other instructional strategies that encourage students to establish connections between diverse subjects and real-life situations (Zhao, 2022). Moreover, comprehensive holistic education places emphasis on fostering students' higher-level thinking abilities, such as analysis, synthesis, and evaluation. This approach empowers students to become self-directed learners capable of applying their knowledge and skills to tackle intricate problems (Zhao, 2022).

Besides academic growth, holistic-comprehensive education prioritizes the social and emotional well-being of students. This can be achieved through the implementation of social-emotional learning (SEL) programs, which teach students important life skills such as self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Fernandes & Junnarkar, 2019). Holistic-comprehensive education values diversity and strives to create an inclusive learning environment where all students feel respected and supported. This approach may involve integrating diverse perspectives and experiences into the curriculum, as well as providing opportunities for students to engage with individuals from different backgrounds and cultures (Fernandes & Junnarkar, 2019).

In the context of educational reform in China, the holistic module learning model has been implemented to enhance students' academic performance and develop their comprehensive abilities through structured classroom learning. This model promotes the development of a systematic and holistic knowledge perspective for all subjects by teachers and students (Zhao, 2022). A conceptual framework has been developed to maintain and promote a positive school climate using a holistic approach. This framework is based on action research in the fields of education and psychology and helps improve the understanding and practices of all stakeholders in the field of education.

Holistic education is a field of research in the field of education and practice in schools based on holistic principles as an alternative to mainstream education. This field has a strong foundation in the humanistic and progressive education movement, but it does not have a single definition or approach. According to Rudge (2008) many educational initiatives claim to be holistic, and holistic education is a widely used term but not

always clearly defined. Forbes (2003) states, "holistic education does not have a core text that explains what it is and what it is not."

One of the well-known contemporary theorists in the field of holistic education is (J. P. Miller, 2019). His book, "The Holistic Curriculum," defines the principles and components of a holistic curriculum. These principles serve as the basis for the categories used in document analysis. As a secondary source and reference in the analysis, the principles of Lucila Rudge are utilized. The doctoral thesis (Rudge, 2008) summarizes and synthesizes various perspectives of theorists on holistic education into principles that identify the holistic education approach.

Other renowned authors are frequently cited to ensure a strong foundation and diverse sources when discussing holistic education. These include R. Miller 91992), particularly his book "What are schools for: Holistic education in American culture," and Forbes (2003), with his work "Holistic education; an analysis of its ideas and nature." Both books are built upon PhD research projects and are extensive works that define holistic education and secure its place in the field of education. Other authors in holistic education often cite the works of John P. Miller, Ron Miller, and Scott H. Forbes, ensuring the legitimacy of their selection as authorities in this thesis. The reason for debating the choice of authors is the lack of a single highest authority or core text defining holistic education.

One important element of holistic education is that it is partially based on relationships. While it is a new movement, holistic education emerges as a response to the mainstream 'mechanistic' worldview of education (Mahmoudi et al., 2012). Based on this assumption, education is based on standards, but holistic education goes beyond just meeting academic standards. It involves a commitment to society and efforts to improve it. Holistic education is not defined solely as a method of delivering knowledge, but rather as a paradigm with assumptions and principles that can be applied in unique and diverse ways (R. Miller, 1992). Thus, holistic education allows for the development of the whole person at all levels, demonstrating the relationship between the whole and its parts. Holistic education provides the greatest opportunity for students to develop and grow, enabling them to become the best version of themselves and develop all aspects of their being. This highlights the element of holistic education, which is the interconnectedness of experience and reality (Mahmoudi et al., 2012).

Through holistic education, efforts are made to develop a dynamic and interconnected pedagogy, leading to harmony between facilities and society. The desire for interconnectedness, which leads to stronger relationships, is very different from mainstream education, which is static and fragmented, leading to alienation (J. P. Miller et al., 2005). Thus, it is evident that holistic education focuses on the existing relationship between the whole and the parts, suggesting further that the learning approach used for students in this situation should be rooted in a larger vision as smaller visions are isolated, resulting in fragmentation. In the perspective of holistic education, students are positioned as active participants engaged in critical learning (R. Miller, 1991).

The concept of holistic vision implies that humans are seen as interconnected with their environment. Furthermore, proponents of holistic education emphasize that the focus is on educating the whole child, educating students as a whole, and viewing children as integral parts of the whole. Holistic educators perceive holistic education as a challenge to mainstream education and its obsession with standardized testing (Hare, 2010). Mainstream education, in comparison to holistic education, is believed to reflect a materialistic and consumeristic culture that prioritizes competition and consumption in the global market, rather than considering the entirety of existence (Arguelles et al., 2003).

Based on data from the Central Statistics Agency (BPS), the frequency of brawls among students in Indonesia in 2014 reached 0.4% of villages/urban neighborhoods. This figure increased to 0.65% in 2018 but experienced a decrease to 0.22% in 2021. This indicates a decrease in brawl incidents in some places in 2021. This decrease may be influenced by the Covid-19 pandemic situation, where the government implemented social restrictions, including face-to-face school activities, in that year.

Another example is provided by the National Population and Family Planning Board (BKKBN), which recorded that 70% of individuals infected with HIV/AIDS are teenagers, and 33% of abortion cases involve teenagers. This shows that the morality of teenagers can be an indicator of the success of holistic education, which is related to the formation of students' character. External factors such as politics, economy, social issues, technology, law, and the environment can influence the quality of a person's education. The impact of these factors can affect the progress or obstacles of the education system in Indonesia.

However, there are positive impacts as well, such as technology that enables access to quality education without spatial and temporal limitations. The law also serves as a tool for protecting students, for example, through the Child Protection Law, which guarantees the rights of children to receive protection while being students. The economy also provides positive contributions, such as school funding assistance through programs like the BOS fund and collaborations between the government and the private sector.

Creating a holistic and comprehensive well-being involves developing and adapting behavior patterns that lead to improved health in the dimensions of well-being and enhancing satisfaction and happiness in life. This approach considers the interconnection between intellectual and social-emotional aspects in learning and emphasizes the importance of meaningful work and academic challenges (Norwich et al., 2022). A whole-school approach involves considerations about what is being learned and how it is taught and learned, with many aspects to it. This text highlights a specific aspect of the whole-school approach, which is teacher well-

being. Holistic and comprehensive well-being includes the well-being of everyone, including teachers (Norozi & Ness, 2023). This means that teacher well-being is just as important as student well-being and has a significant impact on student well-being. When teachers experience well-being, they are more likely to consider student well-being as an integral part of their work.

Holistic and comprehensive well-being consists of meaningful work and academic challenges, recognizing the interconnectedness between intellectual and social-emotional aspects in learning. It goes beyond just feeling healthy, happy, attentive, or resilient, and more than just feeling safe and protected from harm. Well-being is a social condition with many facets involving inclusion, ownership, peace, and human rights. Effective well-being programs and policies should build a relationship between children's psychological conditions and the world's conditions. Holistic and comprehensive well-being requires a nuanced well-being concept that includes meaningful learning and challenges (Norwich et al., 2022). The importance of holistic and comprehensive well-being is that the identified dimensions are framed as facilitating engagement with education and well-being as a result of education.

CONCLUSION

Comprehensive holistic education is a crucial approach in facing the era of the 4.0 industrial revolution. The implementation of a comprehensive holistic education program can help enhance students' readiness in dealing with technological changes and global demands. In the context of education, the holistic approach considers the spiritual, intellectual, creative, emotional, artistic, social, and physical aspects of students. Furthermore, holistic education also emphasizes the importance of developing high-level thinking skills, social and emotional well-being of students, and inclusivity in the learning environment. By applying a comprehensive holistic approach, education can become more effective in preparing students to face the continuous challenges and changes in the digitalization era and the 4.0 industrial revolution.

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