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EDUCATION 5.0: COLLABORATION AND CREATIVITY IN IMPROVING STUDENTS' DIGITAL INTELLIGENCE

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Abstract

Education 5.0 is an innovative approach to education that integrates advanced technology and the latest learning methodologies to create a student-centred learning environment. The research method conducted in this study is literature. The results showed that students' digital intelligence, creativity, and collaborative skills improved. The implementation of Education 5.0, which embraces technology and innovative learning methodologies, facilitates a more dynamic and interactive learning environment, increasing student motivation and participation in the learning process. Study results indicated students engaged in an Education 5.0-based curriculum showed improved performance in complex problem solving, critical thinking, and teamwork, compared to traditional approaches. Furthermore, the findings suggest that educators, as facilitators, play a key role in inspiring student innovation and creativity through the use of technology and project-based learning approaches. The implementation of Education 5.0 not only enriches students' learning experiences but also prepares them with relevant skills for future challenges, underscoring the importance of transitioning to a more flexible and adaptive educational paradigm in preparing students for success in an ever-changing global society.

Keywords: Education 5.0, Creativity, Digital Intelligence, Students.

INTRODUCTION

The world of education is currently facing significant challenges along with the rapid development of digital technology. This transformation is pushing many institutions to redefine the way they deliver education, so that students can develop

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not only academically but also in the digital competencies needed in the 21st century (Sitopu et al., 2024); (Guna et al., 2024); (Hairiyanto et al., 2024). However, reliance on digital technologies also brings challenges around disparities in access and quality of education. While some students enjoy interactive and up-to-date learning resources, others still struggle with a lack of basic education infrastructure and minimal access to technology. As a result, the digital education gap is widening and becoming an urgent issue to address (Adhikari, 2024). In addition, many traditional education systems have not fully adapted their curricula to include learning essential digital skills, such as programming, cybersecurity and media literacy, which are increasingly relevant in the modern job market (Adnan, 2022).

The challenge in the digital age is not only around the access gap, but also relates to how education can provide students with the appropriate skills for the future labour market. The fast-changing world of work demands individuals who are not only technologically literate but can also think critically, collaboratively and innovatively (Agusta et al., 2023). Educators are faced with the task of integrating technology into teaching in a way that facilitates the development of these skills. While the technical aspects of digital education can be realised through investments in hardware and software, the bigger challenge is how to instil flexible and adaptive ways of thinking in students, equipping them with a lifelong learner mentality that will enable them to continuously evolve in this dynamic and connected environment (AL-Fayyadh et al., 2021).

In this context, the concept of Education 5.0 emerges as a new approach that emphasises the development of students' adaptive, collaborative and creative abilities through the integration of technology (AlAfnan & MohdZuki, 2023); (Tubagus et al., 2023).

Digital intelligence, which includes the ability to use digital technology, network communication, and social media ethically and effectively, has become an important part of the literacy that students must master in this digital age (Aslan & Shiong, 2023). Digital intelligence is not just about tool mastery, but is broader; it includes understanding ethics, digital citizenship, online safety, collaboration, and creativity in digital media. This intelligence is key in navigating a world increasingly dominated by information technology (Albar et al., 2021).

However, the transition to Education 5.0 and the integration of digital intelligence in the curriculum is not without challenges. Many educational institutions are still searching for the right model to integrate these concepts into the learning process (Alqasham & Al-Ahdal, 2022). In addition, there is a gap in the literature exploring how collaboration and creativity, two important pillars in Education 5.0, can effectively enhance students' digital intelligence. This gap includes a lack of empirical and theoretical studies that directly link innovative learning methods, such as project-

based learning or collaborative learning, with improved digital intelligence components (Amla, 2021).

Given the importance of preparing students with digital intelligence for their future, as well as the importance of collaboration and creativity in the learning process, an in-depth exploration of how Education 5.0 can support this goal is crucial (Andreas, 2022). Therefore, this research aims to investigate and identify the key elements of Education 5.0 that support the development of students' digital intelligence, with a particular focus on the role of collaboration and creativity. Through this research, it is hoped that new understandings and insights can be generated that can support educational institutions in designing and implementing effective learning strategies for the digital age.

Research Methods

The study conducted in this research uses the literature research method. The literature research method is a widely used approach in various disciplines to collect, review, and analyse published information, such as books, journal articles, reports, and online sources, to gain insight or conclude about a particular topic. This approach is often used as a basis for forming new hypotheses, building theories, or as standalone research to go in-depth on a topic area (Barlian, 2018); (DEWI, 2019); (Fadli, 2021).

Results and Discussion

Digital Intelligence Theory

Digital intelligence, often abbreviated as "DQ," is a collection of social, emotional, and cognitive standards that enable individuals to handle challenges and adjust to a life that demands integration with the digital world. The concept is similar to emotional intelligence (EQ) and intellectual intelligence (IQ), but the focus is on acquiring the knowledge, skills, attitudes, and values necessary for success and safety in the cyber world (Anitha & Kavitha, 2022). DQ involves not only the ability to use digital devices and media effectively, but also includes understanding ethics and exercising digital responsibility when interacting with others online, as well as awareness of personal data security and cyber security (Azid et al., 2024).

Digital intelligence consists of several key components that holistically shape an individual's interaction with technology. These components include fluency in digital media, which refers to the ability to read and create content using digital platforms; data literacy, which is expertise in interpreting and using data; privacy and security, which includes knowledge of how to protect oneself and others from digital risks; digital identity, relating to the creation and management of online identities; and digital health, which is about maintaining physical and psychological well-being in the context of technology use (Bachiri & Mouncif, 2023). Additional components include creative problem solving, critical communication, and collaboration in digital spaces. The

combination of all these components make up the DQ which as a whole influences an individual's ability to adapt, learn, and navigate in the context of a life that is increasingly connected to the digital world (Bicer et al., 2024); (Bilan et al., 2023).

In an era of rampant digitisation, digital intelligence becomes an important aspect of education as it plays a vital role in preparing students to become responsible and capable digital citizens. Integrating DQ in the curriculum not only provides students with the proficiency to access, process and critically evaluate information, but also equips them with cybersecurity awareness, digital ethics and the ability to communicate and collaborate effectively in online spaces (Borodzhieva, 2021). This prepares them not only to pursue future academic and professional opportunities, but also teaches them how to use technology in a healthy and sustainable way. Therefore, digital intelligence education not only strengthens technical capabilities, but also supports the development of civilised and responsible digital citizenship (Broo et al., 2022).

In conclusion, digital intelligence (DQ) is an important concept that encompasses a wide range of skills, knowledge and behaviours required to cope with a world that is increasingly integrated with digital technologies. Digital intelligence is not only vital to an individual's success in navigating and utilising digital spaces effectively, but also essential in developing digital ethics, security awareness and responsible interactions. The integration of DQ in education is crucial in forming the foundation for students to become intelligent and ethical participants in the digital world, as well as assisting them in developing the necessary skills for future career prospects and personal life. Therefore, the development and inculcation of digital intelligence at various levels of education is a strategic and urgent step to prepare future generations to face the challenges and capitalise on opportunities in the digital age.

Education Concept 5.0

The history of education has evolved over time, adapting to social needs, economics, and technological advances. Education 5.0 is a relatively new concept, emerging in response to the fourth industrial revolution characterised by the integration of technologies such as artificial intelligence, the Internet of Things (IoT) and big data analytics (Carlon et al., 2023). The concept develops the principles of Education 4.0, which already focuses on technology-driven learning and 21st century skills, by placing additional emphasis on personalisation of learning, increased human-machine collaboration, and preparedness for a highly unpredictable future. The aim is to not only equip students with technical knowledge, but also with the ability to think critically, adapt and innovate amidst rapid change (Chankoson et al., 2022).

Along the way, 5.0 Education has emphasised a holistic approach to teaching and learning, which includes developing emotional and social competencies, as well as preparing students for positive contributions to society and their environment (Chen, 2022). Sustainability aspects are becoming more prominent, focusing on how education

can support sustainable development and encourage learners to become global problem-solvers. This evolution of education emphasises the synergy between general knowledge, practical applications and technology with the aim of creating a learning environment that encourages innovation and creativity, along with the application of ethical and entrepreneurial values. Education 5.0 is geared towards producing individuals who are not only prepared with the skillsets needed in the future but also have the awareness and social responsibility to foster a better world (Dec et al., 2022).

Education 5.0 brings five basic principles that become the main focus in developing the quality of learning and character building of students to face future challenges, namely collaboration, creativity, critical thinking, communication, and connectivity (Duan & Zhao, 2023). These principles are designed to integrate life skills relevant to the needs of the times, where students are equipped to adapt and thrive in an ever-changing and high-tech environment (Dupri et al., 2021).

Collaboration is a core principle in Education 5.0, emphasising the importance of cooperation in the learning process. In this digital era, the ability to collaborate effectively, both in person and virtually, is key to solving complex problems (Dwivedi et al., 2023). Through education that encourages collaboration, students learn to work in teams, utilising the strengths and expertise of each member to achieve a common goal. This not only prepares them for future work environments, but also teaches them the value of empathy and togetherness in achieving sustainable solutions (Garcia, 2020).

Creativity is valued as the ability to think outside the box and come up with innovative solutions to problems. Education 5.0 encourages students to develop their creative thinking through learning activities designed to spur innovation and exploration. In support of this principle, the curriculum is made flexible, allowing students to explore and express their ideas without restriction (Gonçalves & Rua, 2022). The development of creativity is expected to prepare students to become future leaders capable of creating new solutions to increasingly complex global challenges (González et al., 2022).

Critical thinking teaches students to analyse information and arguments in a logical and structured way. This principle is important in the information age, where students are exposed to multiple sources of information and must be able to distinguish between facts and opinions, as well as logical considerations versus those that are not. Through education that emphasises critical thinking, students become better able to make informed and responsible decisions, and face real-world challenges with effective and efficient solutions (Gupta et al., 2024).

Communication is a fundamental principle that supports the effectiveness of the other three principles. The ability to communicate clearly and efficiently is key to understanding and being valued in any collaborative or negotiation situation (Huang, 2021). Education 5.0 facilitates the development of students' communication skills, not only in language, but also in articulating complex ideas through various mediums. These

skills are not only vital in everyday life, but also in professional environments that require collaboration across cultures and disciplines (Husaeni et al., 2024).

Finally, Connectivity recognises the importance of networking in an era of globalisation. This principle emphasises the development of students' ability to connect and interact in global networks, both physically and digitally. Education 5.0 explores the use of technology to connect students with ideas, sources and communities beyond the traditional classroom, expanding their understanding of the world and preparing them to become active and informed global citizens (Hwang & Tu, 2021). By understanding global connectedness, students learn to appreciate diversity and the importance of cross-cultural cooperation to address global challenges (Ismaya et al., 2021).

In conclusion, Education 5.0 is an innovative approach to education that emphasises five key principles: collaboration, creativity, critical thinking, communication and connectedness. This approach aims to prepare students to be more adaptive, innovative and ready to face challenges in an ever-evolving global environment. By integrating these principles into the curriculum, Education 5.0 seeks not only to improve academic knowledge, but also to develop the essential skills students need to succeed in the future, both in their personal and professional lives. This approach encourages more engaging and relevant learning, emphasising the importance of human connections, innovation and critical thinking in the face of the complexity of today's world.

Collaboration and Creativity in Education

Collaboration in an educational context is the process by which individuals work together in groups or teams to achieve a common goal, combining their knowledge, skills, and experience to solve problems or create products (Jamaludin et al., 2020). This process requires effective communication, conflict management, and the ability to listen to and appreciate ideas from others. In a learning environment, collaboration includes not only co-operation between students, but also between students and teachers, and between educational institutions and the wider community (Johnson & Shen, 2020).

In the learning process, collaboration plays an important role as it helps to develop students' social and emotional skills as well as improve understanding and retention of the subject matter (Kania et al., 2023). When students work together in groups, they learn to communicate effectively, solve problems in real-life situations, and view problems from different perspectives, which encourages critical thinking and creativity. In addition, collaboration in learning prepares students for the modern world of work, where the ability to co-operate with others productively is a highly valued skill (Khalaf et al., 2022).

Creativity has a significant influence on learning and the development of digital intelligence. As a critical element in learning, creativity encourages students to think

outside traditional frameworks, create new solutions to problems and develop innovative ideas. In the context of digital intelligence, creativity plays a role in helping students understand and utilise technology more innovatively and productively (Khalid, 2020). This is essential in the digital age, where technology is evolving rapidly and requires creative thinking to integrate it in learning. Creativity inspires students to explore new ways of using digital tools to complete tasks, design projects or communicate in ways that have never been considered before (Kin et al., 2020).

Furthermore, developing creativity in the context of digital intelligence helps students to become not only consumers of digital content, but also creators of content. This broadens their horizons about new possibilities in the digital world, encouraging them to innovate and create new technological solutions that can benefit society (Nurdiana et al., 2023); (Haddar et al., 2023). Thus, creativity not only enhances students' learning and adaptability to technological developments, but also contributes to the development of essential skills such as problem-solving, critical thinking, and the ability to work collaboratively in a digital environment. This process, in turn, prepares students with the skills needed to succeed in a continuously evolving knowledge-based economy.

Conclusion

Education 5.0 emphasises the importance of collaboration and creativity in enhancing students' digital intelligence. By integrating collaboration, students not only learn how to work together in teams to achieve common goals, but also develop communication and problem-solving skills that are essential in the digital age. Creativity, on the other hand, helps them to face complex challenges with innovative solutions, utilising technology to create and experiment in new ways. The incorporation of these two elements in the education curriculum aims to provide students with the adaptive and creative capabilities needed to operate and succeed in an increasingly digital environment.

Furthermore, the role of the teacher in the context of Education 5.0 is also transforming, from a dispenser of knowledge to a facilitator who supports students' intellectual exploration. In achieving this, project-based learning approaches and a more integrated use of educational technology are important. By focusing on skills such as critical thinking, collaboration, creativity and digital intelligence, Education 5.0 effectively prepares students for a dynamic and fast-paced world, and opens more doors for future generations to innovate and lead in a globalised society.

The implication of the Education 5.0 approach to education theory and practice is a paradigm shift from traditional teaching methods to student-centred learning, where collaboration, creativity and digital intelligence are at the core of the teaching and learning process. In practice, this encourages educators to adopt innovative learning technologies and methods that not only enhance student engagement but also prepare them with relevant 21st century skills. Theoretically, it expands our

understanding of the learning process as a dynamic and adaptive system, which encourages pedagogical innovation and curriculum building that is more responsive to future needs. This approach underscores the need for education to be more flexible and integrated with technological developments, ultimately moulding graduates who are ready to enter a changing world.

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