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EXPLORING EDUCATION IN THE DIGITAL AGE: INNOVATIONS, INTERSECTIONS AND INSIGHTS

PREFACE

Dear esteemed readers and contributors,

It is with great pleasure and excitement that I extend a warm welcome to you all to this special edition of our journal, dedicated to exploring the diverse and dynamic themes shaping the landscape of education in the digital era. As we embark on this journey of discovery, each theme serves as a guiding beacon, illuminating the innovative intersections of technology and pedagogy.

Our first theme, Teaching based on Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), sets the stage for our exploration by delving into the transformative potential of intelligent technologies in education. From personalized learning experiences to predictive analytics, AI, ML, and IoT hold the promise of revolutionizing traditional teaching methods and unlocking new pathways to knowledge acquisition.

Theme 2 invites us to immerse ourselves in the realm of 360 Learning, Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Here, we witness the fusion of physical and digital worlds, as learners embark on immersive journeys that transcend the confines of the traditional classroom. Through experiential learning and interactive simulations, VR, AR, and MR technologies redefine the boundaries of education, offering unprecedented opportunities for engagement and exploration.

In Theme 3, we explore the power of Collaborative Teaching, Global Learning, and innovative practices such as Gamification, Maker-Space, and Maker Lab initiatives. This theme underscores the importance of collaboration, cultural exchange, and hands-on experimentation in fostering creativity, critical thinking, and problem-solving skills among learners worldwide.

Theme 4 sheds light on the paradigm shift towards Open and Distance Learning (ODL), Self-Instructional Materials (SIM), and the utilization of Big Data Analytics in Learning. Here, we witness the democratization of education, as learners gain access to high-quality resources and personalized learning experiences irrespective of geographical constraints. Big Data analytics further enhance the educational landscape by providing insights into learner behavior and preferences, enabling educators to tailor instruction to individual needs.

In Theme 5, we explore the evolving role of Social Media Learning as a catalyst for knowledge dissemination, collaboration, and community building. From online forums to multimedia platforms, social media offers a dynamic space for peer-to-peer learning, digital literacy development, and the cultivation of virtual learning communities.

Theme 6 invites us to embrace Design Thinking for new Learning Delivery, emphasizing the importance of user- centered design principles in creating innovative and inclusive learning experiences. Through empathetic design, educators can reimagine learning environments that foster creativity, adaptability, and lifelong learning skills.

In Theme 7, we delve into Andragogy in technology-based learning, Instructional Design, and Best Practices in e-learning. This theme highlights the importance of learner-centered approaches, effective instructional design strategies, and the dissemination of evidence-based practices to optimize learning outcomes in the digital age.

Finally, Theme 8 explores the Development of e-learning systems, materials, and mobile technologies, including the emergence of MOOC-based mobile learning materials. Here, we witness the evolution of educational technologies, as mobile devices and online platforms redefine the boundaries of access and engagement in education.

As we navigate through these diverse themes, let us embrace the spirit of inquiry, collaboration, and innovation that defines our scholarly community. I extend my deepest gratitude to all the contributors who have enriched this journal with their insights and expertise. May this edition inspire new ideas, spark fruitful discussions, and contribute to the ongoing dialogue surrounding the future of education.

Thank you for your dedication and commitment to advancing the frontiers of knowledge in the field of education.

PROFESOR MADYA DR. ZAINUDDIN IBRAHIM
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Theme 1: Teaching based on Artificial Intelligence (Ai)/ Machine Learning (ML)/ Internet of Things (iOT)

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2. Exploring the Potential of Artificial Intelligence in Chemical Engineering Education

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3. Incorporating the Concept of A.D.A.B into Curriculum Design: A Reflection Journey
4. Digital Game-Based Value Learning Model for Management Students in Malaysian Higher Education Institutions
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1. Challenges and Innovations: Adapting Practical Culinary and Foodservice Subjects for Distance Learning during COVID-19
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Theme 8: Development of e-learning system/Development of e-learning materials/Development of mobile systems in Learning/Development of MOOC-based mobile learning materials

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Digital Game-Based Value Learning Model for Management Students in Malaysian Higher Education Institutions

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ABSTRACT
This concept paper proposes integrating explicit, implicit, and social education values into the Game-Based Learning Model to enhance Malaysian higher education. As the world embraces the 4th Industrial Revolution (IR4.0), higher education must adapt digitally to prepare students for post-graduation realities. The primary objective is to explore education values within learning circles of the Game-Based Learning Model. The secondary objective is to merge these values into the existing model, leading to validation within the new Digital Game-Based Value Learning Framework. Qualitative methods, including semi-structured interviews with 10 to 12 purposively sampled management students experienced in digital game-based learning, will be employed for data collection. Findings aim to augment the current model in line with the Ministry of Higher Education's digitalisation agenda. Researchers anticipate the Climb the Corporate Ladder (CTCL) Virtual Board Game to offer significant educational value, aiding in achieving research objectives.

Keywords: active teaching and learning, game-based value learning model, government university, higher education, virtual board game

INTRODUCTION

The world is still currently within the bounds of Coronavirus disease 2019 (COVID-19) pandemic. The whole world shuts down since early 2020 and is still battling the ups and downs of COVID-19 case numbers among its citizens to this day. Meanwhile, Malaysia has been under several series of lockdowns since the pandemic, which had forced higher education institutions to limit face-to-face interactions or close temporarily. Two years into the COVID-19 pandemic, the institutions have started opening their doors again to face-to-face activities, with permanent and bold changes such as introducing more blended and online learning instead of 100% traditional learning methods. The pandemic required educators to be instantly creative and innovative in adopting new active teaching and learning strategies like the Educational Game Learning approach (Nieto-Escamez & Roldán-Tapia, 2021). The pandemic caused by COVID-19 has changed Malaysia Higher Education Institution teaching and learning landscape from the traditional approach of 'face-to-face' to 'Online Distance Learning' (ODL) (Nieto-Escamez & Roldán-Tapia, 2021). With the current situation restricting physical classes, the application of Digital Game-Based Learning (DGBL) has become increasingly popular since everyone is connected to the Internet and as we all know, games are youngsters' main interest. It provides students with a fun, interactive and challenging environment. The currently existing Game-Based Learning Model only covers instructional content, game characteristics, and learning outcomes without emphasising on human touch factor.

The objectives of the study are investigating the education values in the process of learning circles as part of the Game-Based Learning Model, besides integrating the aforementioned education values with the existing Game-Based Learning Model, thus validating the education values as part of the new Digital Game-Based Value Learning Framework. Thus, the researchers aim to enhance the existing Game-Based Learning Model by introducing education values which comprise of implicit, explicit, and social values, that glues and takes the human touch factor in digital learning into consideration, and then introducing it as the new Digital Game-based Learning Framework. With the rise in technological advancements occurring worldwide due to the 4th

Industrial Revolution (4IR), the researchers believe that this study complements Malaysian government policies, particularly efforts by the Ministry of Higher Education (MOHE), in digitalising higher education institutions, while keeping in line with the Twelfth Malaysia Plan by the Ministry of Economy (2021) too, which aims to digitalise education. Therefore, it is also aligned with Sustainable Development Goals number 4; Quality of Education by focusing on upgrading education facilities and creating effective learning environments.

According to former Minister of Higher Education, YB Datuk Seri Noraini Ahmad, in her speech in the Mandate of Ministry of Higher Education (MOHE) 2022, the first out of six of last year's strategic focus was 'Strengthening the Agenda of Education Digitalization' (Ahmad, 2022). The year 2021 was the year for preparing the digitalisation ecosystem for higher education. The details were in a draft detailing the Higher Education Digitalization Plan, where RM4.4 billion was needed to ensure a smooth sailing plan. In addition, MOHE published a report, 'Research Report – Digitalizing of Teaching and Learning in Higher Education: A Reality Check', which included initiatives and suggestions relating to policies in terms of online teaching and learning (T&L). Besides that, numerous programs are conducted, including developing digital content, expanding Open and Distance Learning (ODL), and strengthening collaboration with Commonwealth of Learning. The Technical and Vocational Education and Training (TVET) learning was redesigned to suit the 4th Industrial Revolution (4IR) Flagship. All of this technological development of learning platforms is to polish students' skills and attributes.

LITERATURE REVIEW

Game-Based Learning Model and Digital Game-Based Learning

Game-based learning and gamification has been trending not only in workplace training but also in higher education. The Game-Based Learning Model process contains input, process, and output. The process consists of the link between game events and real-world events and connected game experience and learning. According to Kuk et al. (2012), the "doing, reflecting, understanding, and applying" process becomes the key in the cycle of the Game-Based Learning Model (Figure 1). In between, the process involves a judgmental and developing behaviour process. The learning output is based on the input consisting of game characteristics and instruction contents.

Figure 1. Using a Game-Based Learning Model as a new teaching strategy for computer engineering (Kuk et al., 2012)

Adipat et al. (2021) claim that there is additional evidence connecting game-based learning to growth and improvement of mentality. The use of educational games in academic settings is

introduced, with a focus on the benefits of improved mentality, social skills, and collaborative learning. Concilio and Braga (2019) examine how to improve game-based learning through instructional design by incorporating gamification and emotional elements. They conclude that this created a more dynamic and stimulating learning environment where teachers are also looking for the right pedagogical approaches within the framework of motivational design and the study of emotions. Raj et al. (2022) posits that educational games can be viewed as a modern expression of the ancient theories and methods that have been used for millennia to teach students language, logic, math, and strategic and tactical thinking. This is an overview of the use of games as teaching tools.

With the current situation restricting physical classes, the application of Digital Game-Based Learning (DGBL) has become increasingly popular since everyone is connected to the Internet. As we all know, games are youngsters' main interest. According to Coller and Scott (2009), DGBL is a learning and teaching approach that utilises digital games/game-based environments to create intriguing, engaging, entertaining, and challenging activities with the goal of achieving learning objectives and producing learning outcomes that can be objectively measured. It offers mixtures of education and gameplay to make learning more enjoyable and engaging. Among the various technology-enhanced learning methods, DGBL has been recognized as an effective method of providing students with a fun, interactive and challenging environment (Chu & Chang, 2014). These days, more researchers have proposed the DGBL models that can be implemented for various syllabus and curriculum.

Studies by Hussein et al. (2019) revealed that DGBL activity significantly improved students' critical thinking skills. The study used Ecoship Endeavour, an educational computer game designed based on the guidelines of the inquiry, communication, mystery, decision making, challenge, and rewards (ICMDCR) framework on two groups of elementary science course students. One group used Ecoship Endeavour as part of their teaching and learning activities, while the other control group continued using the traditional class method. However, this quasi-experiment shows that DGBL activity does not affect students' learning motivation and self-efficacy for science learning as both groups portrayed similar outcomes.

A study conducted by Zin et al. (2009) has proposed the DGBL model for history subjects, where they blended the instructional design (ID) process and game development process. DGBL-ID for History educational games model consists of five phases: analysis phase, design phase, development phase, quality assurance phase, and implementation and evaluation phase. History subject was chosen as most students find it difficult and tedious because they must memorise all the facts in the textbook while trying to understand the facts, concepts, time, and events.

A DGBL model named the IDDTI model was created by Hussain et al. (2014) for primary students weak in Mathematics. It was explicitly designed to develop remedial mathematics games called 1 Minit Ujian Matematik. The model consists of five phases: idea, design, development, testing and implementation, where each phase has a sequential working arrangement and is hierarchically related to each other. It was also designed by involving subject matter experts (SME) and game design experts (GDE) that collaborated to produce quality games for educational purposes. The study also aimed to identify appropriate learning methods for remedial mathematics students in primary schools and be considered as an alternative to traditional teacher-centred

learning methods.

There may be educational advantages to DGBL. The usefulness of educational games in raising student engagement and information acquisition was the main emphasis of Papadakis et al. (2020) research. The result suggests that DGBL can serve as a useful instrument for advancing educational ideals. The majority of adolescents' free time these days is spent playing video games, and it is anticipated that this will eventually become the main way that people in our society interact with popular culture. Because they have the ability to increase student motivation and engagement in the classroom, digital games are viewed by many educators as powerfully motivating digital environments. They can also be used to create socially interactive, constructivist learning environments and educational processes that are tailored to the needs of individual students.

Education Values

The teaching and learning process in educational institutions is a formal way of educating students. According to the standard curriculum design, the formal subject is the primary source of knowledge and can be formal or informal. When learning formally, students will gain explicit values from the curriculum standard. At the same time, being in the environment will expose students to informal knowledge whether they realise it or not. According to Thornberg (2008), explicit values education is the formal learning process in schools with an official curriculum, while implicit values education is the indirect knowledge gathered in the curriculum. People only notice formal education to gain knowledge since it is more organised and accessible as it monitors and measures performance standards. The existence of the curriculum makes it visible and clear. Explicit values education is more effective as a guideline for students because it is visible than implicit value education (Sigurdardottir et al., 2019). There are five basic approaches to values education: inculcation, moral development, analysis, value clarification, and action learning (Huitt, 2004).

Even though explicit value education is more effective than implicit value, we cannot deny the importance of implicit value education in shaping students to become people with good values and character. This implicit value education has started as early as before children enrol in schools to get formal education. Parents' guidance is vital in developing a child's behaviour. Parents' learning is more on implicit value because the child gains experiences and values about life from the daily activities and interaction at home. Children learn to socialise and live in a community from explicit and implicit values education (Sigurdardottir et al., 2019). Knowledge obtained from teachers at school and learning from parents at home is equally important because both give different values of education. Implicit value education can be gained at home solely as well as from formal education in schools. Implicit value education exists by participating in activities inside or outside the classroom. Morton et al. (2019) mentioned that when engaging in the social environment, students are indirectly learning the implicit curriculum, which helps them adapt to the norms and values in occupation. An implicit curriculum is important as it will give students the experience from their environment (Motz, 2021). Exposing students to real-life situations and current environments will enhance their social and survival skills.

Social values were found to directly impact students' intentions to study online courses. Baber (2022) investigated the importance of social interaction on the effectiveness of online

learning during the pandemic when social distancing norms are in place. The finding suggested that social interaction has a significant positive impact on the effectiveness of online learning. However, this effect is reduced in the presence of social distance norms as people give more importance to continuous learning and saving lives rather than socialising in the online environment. However, according to Walker and Weidenbenner (2019), technology is best seen as an instrument of assessing and teaching socio-emotional skills, but not as the only means to an end. What makes us human can only be taught within an ecology of human interaction in real-life situations. The use of online mediums has affected the transformation of social values among students since the limitation of interaction in real life. However, according to Rezer (2021), students did gain values of efficiency, self-control, responsibility, and honesty through online learning.

From the literature reviews done, the researcher found that the currently existing Game-Based Learning Model lacks the human touch aspect. Therefore, the researchers see it fit to introduce education values which comprise of explicit, implicit, and social values into the model, and introduce it as a newly enhanced Digital Game-Based Learning Framework.

METHODOLOGY

Research Design

The main reason for using the qualitative approach is to gather all the inputs to propose education values as a part of the Digital Game-Based Value Learning Framework. This descriptive study plans to clear the picture of the phenomena that need the existence of education values as a part of the Digital Game-Based Value Learning Framework process (Saunders et al., 2009).

The researchers intend to use the Multi-Method data collection technique (Saunders et al., 2009). Data collection will begin with a semi-structured interview for primary data collection followed by a non-participant observer by implementing structure observational studies (Cavana et al., 2001). This study uses deductive and inductive approaches to develop themes. Those approaches will assist this study to extract main ideas from the literature reviews regarding the education values as a part of the Digital Game-Based Value Learning model. The researchers will also use Inductive Approach to generate inputs from the interview section. By combining these approaches, the researchers plan to have a set of themes for answering research objectives.

The research strategy is based on phenomenological and life experiences from participants of the study. The phenomenological approach refers to an interview session with a group of individuals who have first-hand knowledge of an event, situation or experience. This study uses Climb the Corporate Ladder (CTCL) Virtual Board Game (Figure 2) for observational studies. The purpose of the simulation game is to explore the values of education that portray the explicit, implicit, and social values in order to integrate and propose the Game-Based Value Learning Model as a second data collection technique. The sample game simulation is to be used in this study because it was designed for general education purposes. Our study proposes this medium in this study to assist researchers in answering research questions and achieve research objectives.

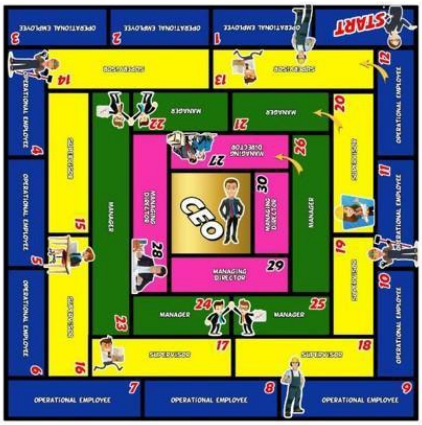

Figure 2. Climb the Corporate Ladder (CTCL) Virtual Board Game

The unit of analysis in this study is based on the individual, focusing on students who have played digital games as part of their learning medium. This research uses cross-sectional or one-shot time frame studies. The quality of research design is based on trustworthiness and maintained with ethical consideration. Creswell (2014) stated a range of 3 to 10 participants for achieving saturation in qualitative interviews. This study plans to gather a range of 10 to 12 participants, who have digital games experiences as a part of the learning medium in any higher education subjects.

Focus group will be used to confirm information received from the semi-structured interviews conducted. The process will include discussing the respondents' opinions and thoughts regarding this study's output generated from semi-interviews. Accordingly, through this approach, the researchers will be able to clarify the information and add any missing inputs (Cavana et al., 2001). The focus group consists of experts in subject matters such as resource persons for subjects or programs in higher education, academician, and so on. The ideal total number of respondents or participants in the focus group is around 4 to 5 (Creswell, 2014). The selection strategies planned to be used in this study was purposive sampling techniques, snowball sampling techniques and piggyback.

Research Process Implementation

Phase 1: The Pilot Test and Interview session. This section is under Preliminary review and Information collection, together with the protocols design and the set of questions for the interview session and observation. The researchers will develop the semi-structured interview and structured observational with proper protocol. After completing the pilot test, a few amendments will be made to align with research objectives.

Phase 2: The researchers will use qualitative data analysis and NVivo software to code and develop the theme or nodes (Thematic Coding Analysis). The researchers will use the report to conduct an analysis based on the research objectives to generate a conclusion at the end of this study. The processes of data collection and analysis will be carried out simultaneously. In qualitative research, there is no natural split between data gathering and analysis (Cavana et al., 2001).

Phase 3: The purpose of the analysis technique in this study is to identify the key themes or patterns from the interview session for further exploration. All the key themes have already been identified based on summarising, categorisation (grouping) and structuring (ordering) of meaning using narrative (Saunders et al., 2009). This phase will be conducted under the Verbatim data analysis method and management and will be followed by a results collection session. Figure 3 shows the step-by-step summary of the analysis process.

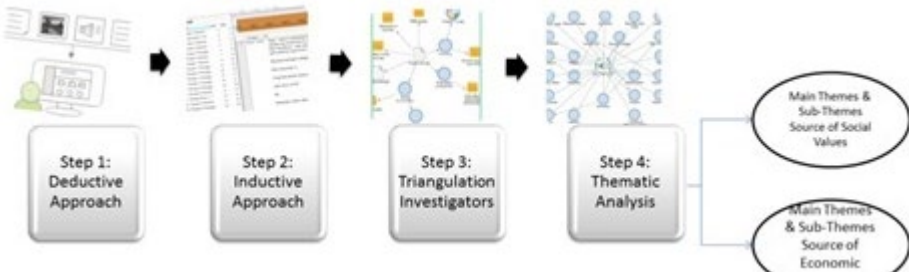

Figure 3. Analysis Process

Phase 4: Answering the Research Question

a) Explorations and Descriptions Analysis, these analyses are used to answer the Research Question 1 and 3.

RQ1 What education values in the process learning circle are part of the Game-Based Learning Model?

RQ3 Do the education values fit in as a significant part of the Games Based Learning Model and become a Digital Game-Based Value Learning Model?

The researchers will analyse the overall themes and patterns through observations and connect the sentences by relating to the research objectives. This study will use visual techniques to support and answer all the research objectives.

b) Comparison Analysis; this analysis will be used to answer Research Question no. 2.

RQ2 How do the education values integrate with the Game-Based Learning Model process?

The researchers classified the sub-themes frequently reported. A comparison was made between the research focus (the value of education) (Figure 4).

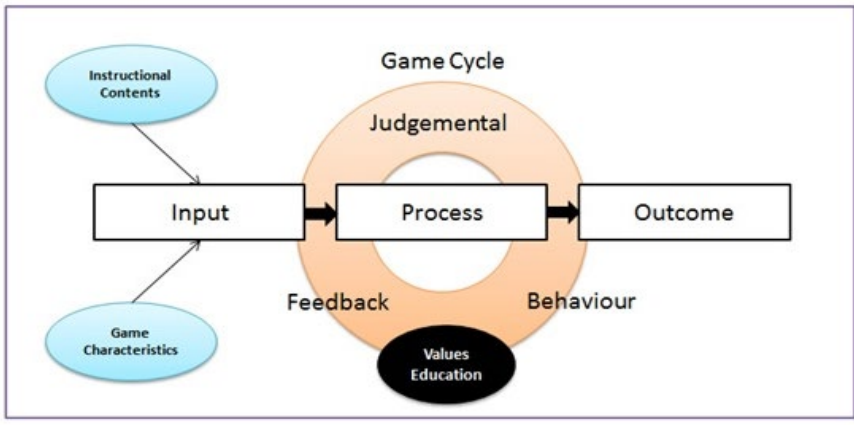

Figure 4. Proposing the Values of Education as Part of the Game-based Learning Process

Phase 5: The results from Data Analysis / Management. In order to classify the main value of education, this study relies on high or low percentages according to the responses from participants related to the themes. This process analysis is known as an exploration and description analysis. Meanwhile, the percentage figure will be provided by Nvivo through preliminary counts of data, and it will determine the frequency of the codes appearing in the database, known as a winnowing process. For the interview session, the percentage is generated according to the timespan coding process content in the transcript and combination from the results of observation. The results will be presented in diagrams, charts, and maps.

CONCLUSION

The introduction of Digital Education Strategy as mentioned in the Twelfth Malaysia Plan is to accelerate digitalisation in the education agenda, which aims to produce a generation that is digitally fluent and promote innovation using digital technology. The researchers see that it is important to instil digital skills among higher institutions students through digital gamification, following the Malaysian Government's and related ministry's efforts. According to Strategic Planning of Graduates' Marketability 2021-2025 by Kementerian Pengajian Tinggi (2021), rapid technological change in the world led by 4IR has changed the business landscape, and human resources have been replaced with robots, machines and automation. Therefore, all these significant changes in the world need immediate attention in terms of digitalising knowledge, T&L, skills, and other related attributes, in line with the rapid technological development. It is imperative to instil digital skills in Malaysian youths from an early age to prepare them for when they enter the working environment after graduation.

SUGGESTIONS

With the world shifting towards IR4.0, it is wise for academicians to look for ways to incorporate social values and human touch to otherwise a very distant and cold teaching and learning experience through technology-based learning. It is true that students do need digital skills to survive in today's world. However, a person's success does not only rely on superb academic results, but also astounding human skills as well. Therefore, we should instil balance between technical & human skills so that our students could strive in the future real-world environment.
As we contemplate the future implications of this study, we extend several recommendations to higher education institutions. Foremost among these is the integration of education values: encompassing explicit, implicit, and social values, into their DGBL strategies. This integration should be comprehensive, fostering holistic development and ethical awareness among students. Faculty members should be prepared through robust training and development programs that equip them with the requisite skills to effectively implement DGBL, with a specific focus on education values.

Curriculum redesign and review are paramount in this holistic implementation, ensuring that educational objectives are aligned with the anticipated outcomes of DGBL experiences. It may entail adaptations to existing curricula and educational policies, aligning them with the new paradigm. To ascertain the effectiveness of these strategies, we recommend further research into

the impact of education values in DGBL, encompassing both learning outcomes and the cultivation of ethical and social competencies. This research should be complemented by the development of assessment tools and methodologies.

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Conflict of Interest

The authors hereby affirmed that there is no conflict of interest in this article.

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Authors' Contributions

Marha Abdol Ghapar, as the leader, has successfully delegated tasks among all authors, in addition to being the one responsible for putting together the manuscript contents into one complete paper. Norlaila Ibrahim has aided the team by contributing to the completion of abstracts and conclusions, as well as pitching in on literature reviews. In addition to that, Azlina Shamsudin and Nik Fakrulhazri Nik Hassan, each contributed fractions and fragments of the literature reviews and research methodology. All authors deeply collaborated to develop a conceptual framework consistent with the study's objectives.

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