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Reconnoitering Innovative Ideas in Postnormal Times

iTAC 2023

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INTERNATIONAL TEACHING AID COMPETITION
E-PROCEEDINGS

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PREFACE

iTAC or International Teaching Aid Competition 2023 was a venue for academicians, researchers, industries, junior and young inventors to showcase their innovative ideas not only in the teaching and learning sphere but also in other numerous disciplines of study. This competition was organised by the Special Interest Group, Public Interest Centre of Excellence (SIG PICE) UiTM Kedah Branch, Malaysia. Its main aim was to promote the production of innovative ideas among academicians, students and also the public at large.

In accordance with the theme "Reconnoitering Innovative Ideas in Post-normal Times", the development of novel ideas from the perspectives of interdisciplinary innovations is more compelling today, especially in the post-covid 19 times. Post-pandemic initiatives are the most relevant in the current world to adapt to new ways of doing things and all these surely require networking and collaboration. Rising to the occasion, iTAC 2023 has managed to attract more than 267 participations for all categories. The staggering number of submissions has proven the relevance of this competition to the academic world and beyond in urging the culture of innovating ideas.

iTAC 2023 committee would like to thank all creative participants for showcasing their innovative ideas with us. As expected in any competition, there will be those who win and those who lose. Congratulations to all the award recipients (Diamond, Gold, Silver and Bronze) for their winning entries. Those who did not make the cut this year can always improve and join us again later.

It is hoped that iTAC 2023 has been a worthy platform for all participating innovators who have shown ingenious efforts in their products and ideas. This compilation of extended abstracts published as iTAC 2023 E-Proceedings contains insights into what current researchers, both experienced and novice, find important and relevant in the post-normal times.

Best regards,

iTAC 2023 Committee
Special Interest Group, Public Interest Centre of Excellence (SIG PICE)
UiTM Kedah Branch
Malaysia

CONSTRUCTION TECHNOLOGY STUDENTS' BEHAVIOURAL INTENTIONS TOWARDS GAME-BASED LEARNING (GBL) IN MALAYSIA: CONCEPTUAL FRAMEWORK

Wan Nur Syazwani Wan Mohammad
Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, 32610 Seri Iskandar, Perak. wannur956@perak.uitm.edu.my

Nurhasyimah Ahmad Zamri
Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, 32610 Seri Iskandar, Perak. nurha382@uitm.edu.my

Raja Nurulhaiza Raja Nhari
Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, 32610 Seri Iskandar, Perak. rajanurulhaiza@uitm.edu.my

Mohd Zul Aswad Zulkifli
Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Sarawak Branch, Jalan Meranek, 94300 Kota Samarahan, Sarawak.
zulaswad@uitm.edu.my

Nor Azizah Talkis
Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, 32610 Seri Iskandar, Perak.
norazizah@uitm.edu.my

ABSTRACT

Virtual learning has become increasingly popular in higher education, with virtual laboratories and technology-enhanced experiential learning tools (i.e., digital games), and is expected to become even more important. However, despite the development of these tools, construction technology students, particularly those studying structural subjects, are still reluctant in applying these tools and use technology relatively infrequently. This is due to the lack of Game-Based Learning (GBL) (i.e., digital or non-digital games) frameworks in the literature that are specific to the students' behavioral intentions. This can lead to difficulties for structural students in understanding the subject matter. To address this issue, this study proposes a conceptual framework for GBL (i.e., digital or non-digital games)

specifically related to the students' behavioral intentions, concentrating on structural students from construction technology programs in Malaysia. Six additional external constructs (i.e., subjective norm, syllabus connectedness, learning opportunities, experience with technology, self-efficacy, and enabling environment) to the original constructs of the Technology Acceptance Model (TAM) (i.e., perceived usefulness and perceived ease of use) are determined. The expected results include the relevance of the previously established constructs, perceived ease of use, perceived usefulness, and six external constructs as well as the hypothesized relationships among these constructs with reference to TAM. The conceptual framework aims to assess the student's performance in understanding structural subjects which then serves as a theoretical base for the development of GBL (i.e., digital or non-digital games) for structural students in Malaysia's construction technology programs.

Keywords: Construction Technology, Structural, Game-Based Learning (GBL), Conceptual Framework, Technology Acceptance Model (TAM)

INTRODUCTION

The importance of digital literacy, critical thinking, and problem-solving in 21st-century learning skills facilitates students to thrive in IR4.0 (MOHE, 2015). As a result, virtual learning (i.e., virtual laboratories), Augmented Reality (AR), Artificial Intelligence (AI), the Internet of Things (IoTs), and technology-enhanced experiential learning tools (i.e., digital games) have created new learning ecosystem in higher education. Game-Based Learning (GBL) is designed with a combination of innovative methods and technology in education. GBL is an effective method for encouraging students to work towards a goal, allowing them to learn through experimentation, practicing behaviors, and thought processes which facilitates them to retain and apply the subject matter to the real world. In addition, the integration of educational content into game environments enables students to acquire expected skills whilst at the same time enjoying the process. Games used for learning basis can be divided into digital games (i.e., use of electronic devices, mobile phones, and computers) and non-digital games (i.e., board games). This research work focuses on GBL which describes the digital or non-digital games application.

Despite the development of these tools, construction and engineering technology students still use game-based learning relatively infrequently (Mostafa et al., 2021: Abdul Bujang et al., 2020). In addition, students' acceptance of educational games in higher education is still low and this can be observed among construction technology students, especially among those who are taking structural design courses. This is due to the lack of Game-Based Learning (GBL) frameworks in the literature that are specific to the students' behavioral intentions. A poor framework in the literature could lead to difficulties for structural students in understanding the subject matter. To address this issue, this study proposes a conceptual framework for GBL related to the students' behavioral intentions, concentrating on structural students from construction technology programs in Malaysia. Prior to that, this study will

also employ the extended Technology Acceptance Model (TAM) to explore the factors that predict the behavioral intention of students toward accepting GBL.

THEORETICAL FRAMEWORK: THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM by Davis (1989) explains the behavioral intention of humans regarding the adoption of information technology. Davis (1989) found that the perceived usefulness and perceived ease of use indicates the acceptance of human information technology. He added that perceived usefulness was the degree of personal trust in adopting an information system that enhances her or his job performance (Sriwardiningsih, 2021). Whilst perceived ease of use was described as how a person's perception of the effort that is required to adopt the technology. The 'attitudes towards the use' and 'behavioral intentions to use' reflect the attitude of human benefit beliefs and increases the behavioral intentions towards implementing the technology which will finally lead to actual technology use (David, 1989; Sriwardiningsih, 2021). Prior research (Jap, 2017; Dele-Ajayi et al., 2019) has demonstrated that behavioural intentions to adopt GBL is a valid and reliable indicator of future GBL adoption. To understand the conceptual framework concerning the adoption of GBL, the application of the TAM model appears to be strongly suggested.

METHODOLOGY

Figure 1 presents the proposed conceptual framework of the study adopted by (Dele-Ajayi et al., 2019). The development of the extended TAM according to Dele-Ajayi et al., (2019) consists of six additional external constructs (i.e., subjective norm, syllabus connectedness, learning opportunities, experience with technology, self-efficacy, and enabling environment) to the original constructs of TAM (i.e., perceived usefulness and perceived ease of use) presented in Figure1. Whilst the hypotheses of the research are shown in Table 1 below:

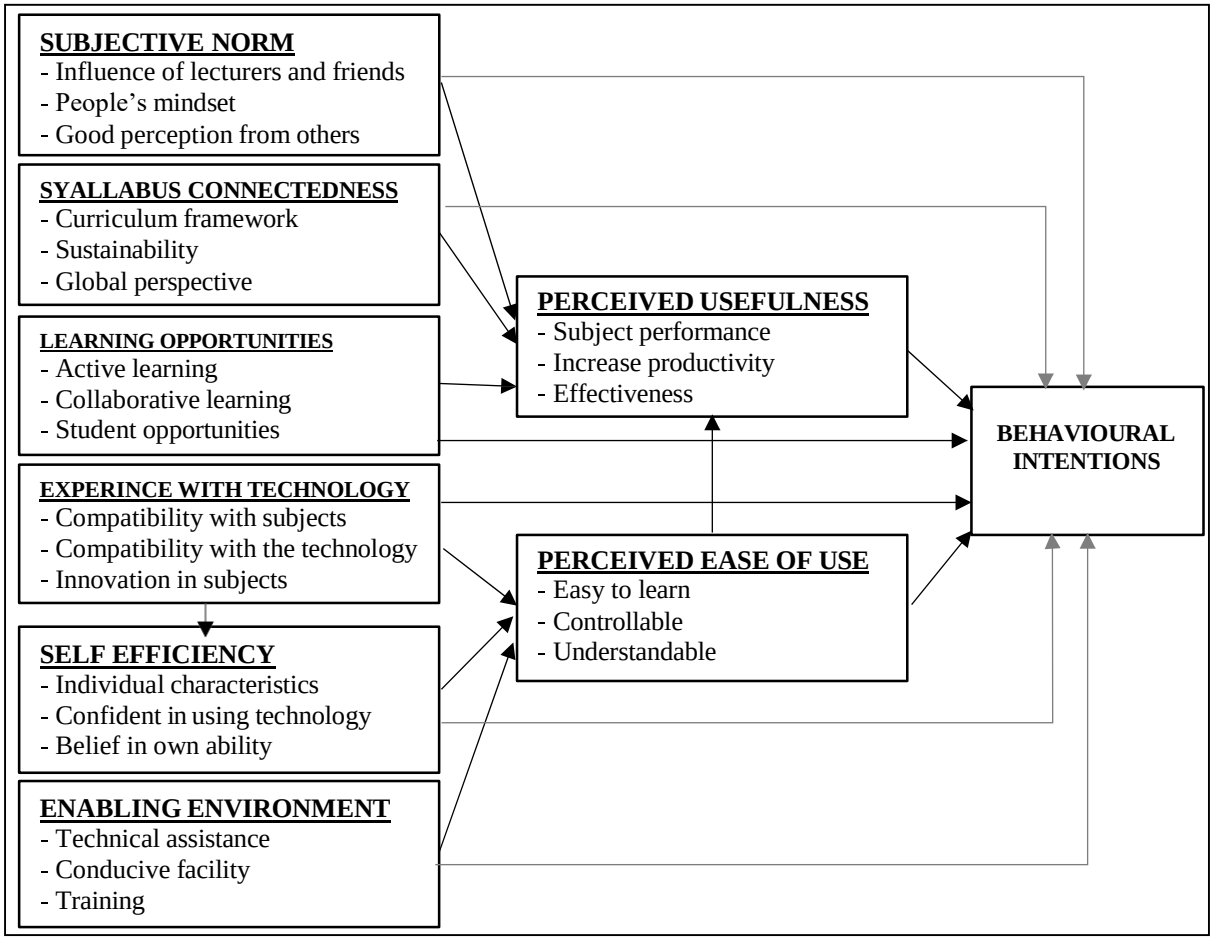

Figure 1. Conceptual Framework of Research (adopted from Dele-Ajayi et al., (2019)

Table 1. Hypotheses of the Proposed Framework

H	Descriptions
1	PU will be positively associated with the students' behavioral intentions towards adopting GBL
2	PEU will be positively associated with the students' behavioral intentions towards adopting GBL
3	PEU will be positively associated with PU
4	Students' SE will be positively associated with their behavioral intentions towards adopting GBL
5	Students' SE will be positively associated with their PEU
6	SC will be positively associated with students' behavioral intentions towards adopting GBL
7	SC will be positively associated with PU towards adopting GBL
8	EE will be positively associated with students' behavioral intentions towards adopting GBL
9	EE will be positively associated with PEU towards adopting GBL
10	ET will be positively associated with students' behavioral intentions towards adopting GBL
11	ET will be positively associated with PEU towards adopting GBL
12	EE will be positively associated with students' SE
13	SN will be positively associated with students' behavioral intentions towards adopting GBL
14	SN will be positively associated with PU
15	LO will be positively associated with students' behavioral intentions towards adopting GBL
16	LO will be positively associated with PU

Remarks: H (Hypothesis); GBL (Game-Based Learning); PU (Perceived usefulness); PEU (Perceived ease of use); SE (Self- Efficacy); SC (Syllabus Connectedness); EE (Enabling Environment); ET (Experience with technology); SN (Subjective Norm); LO (Learning Opportunities)

The questionnaires for this study will be designed based on the indicators provided in Table 1 which are derived from the TAM model. Each indicator will be measured using a five-point Likert scale, which ranges from "strongly disagree" to "strongly agree". Data collection will be conducted through a survey using a Google form. The analysis of the study will assess internal consistency using Cronbach Alpha, as well as examine the validity, reliability and the hypotheses relationship through the Structural Equation Modeling (SEM).

CONCLUSION

The proposed conceptual framework aims to assess the student's performance in understanding structural subjects, which then can serve as a theoretical base for the development of GBL for construction technology students in Malaysia. By identifying the new indicator under six external constructs by using extended TAM theory, as a result, it contributes to and expands upon existing theory. The adoption of GBL can help bridge the digital literacy gap and better prepare construction technology students for the demand of the workforce. Finally, the findings from this study will also provide new insights and ideas for Malaysian higher education, facilitating academicians in improving the existing and future teaching and learning practices.

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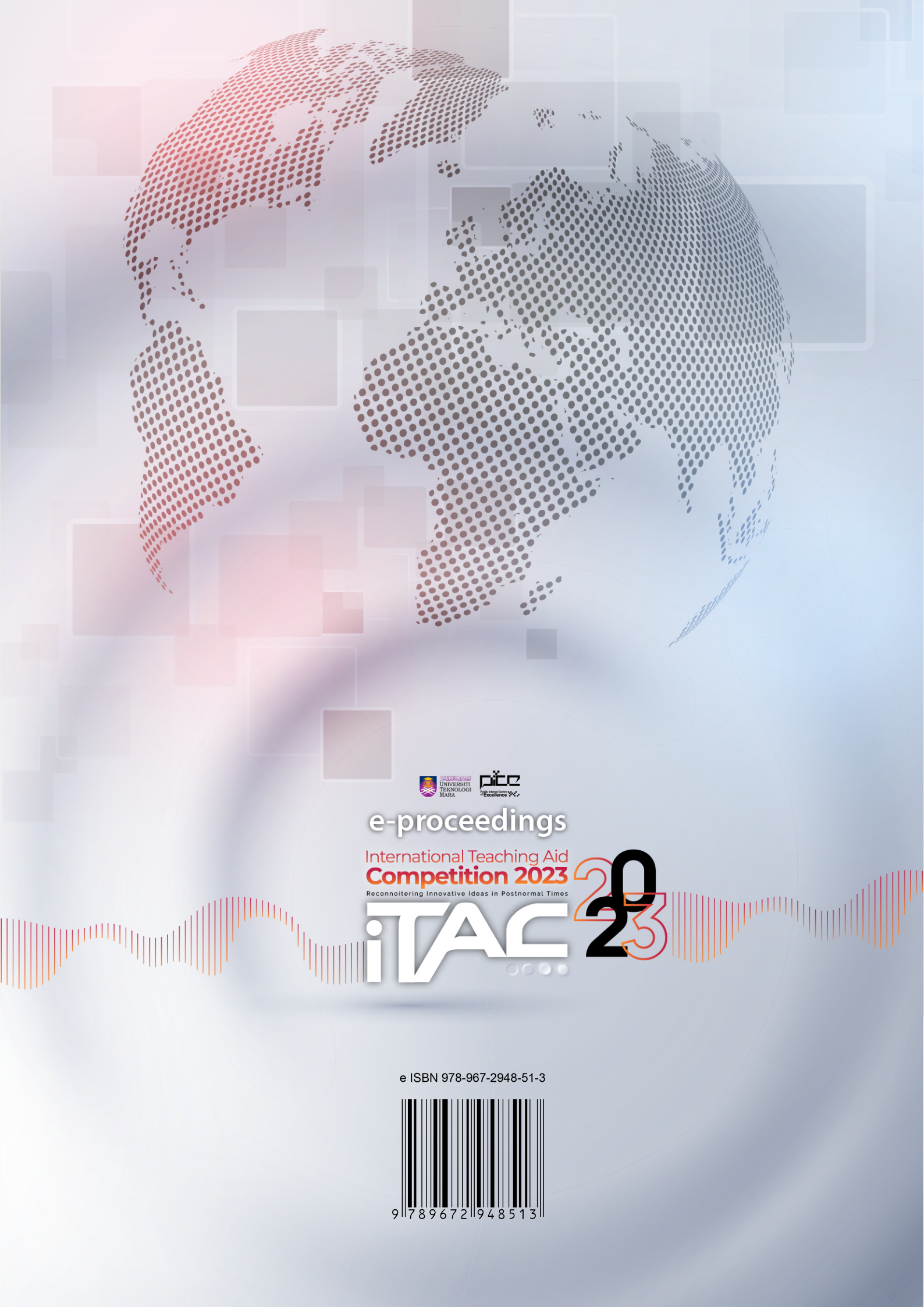

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