

แบบฟอร์มการขอเสนอวาระเข้าที่ประชุม
คณะกรรมการประจำคณะการบริการและการท่องเที่ยว
เรื่อง การขอกำหนดตำแหน่งทางวิชาการ ราย Mrs.Veronica Aguilos Jamieson

ความเป็นมา

ตามที่ Mrs.Veronica Aguilos Jamieson พนักงานมหาวิทยาลัย ตำแหน่งอาจารย์ ได้ยื่นขอกำหนดตำแหน่งทางวิชาการ ตำแหน่งผู้ช่วยศาสตราจารย์ ตามบันทึกที่ มอ 302.1/68 ลงวันที่ 13 กุมภาพันธ์ 2568 โดยได้นำเข้าพิจารณาในที่ประชุมคณะกรรมการประจำคณะการบริการและการท่องเที่ยว ครั้งที่ 2/2568 เมื่อวันที่ 19 กุมภาพันธ์ 2568 โดยมีกรรมการประจำคณะมีมติให้แก้ไข ดังนี้

1. กรุณาระบุหมายเลขหน้าสำหรับแต่ละบทความ
2. กรุณาระบุจำนวนการอ้างอิงทั้งหมดของวารสารสำหรับแต่ละบทความ
3. เนื่องจาก Asst.Prof.Dr. Kevin Fuchs มีรายชื่ออยู่ในหลายบทบาท เห็นควรมีรายชื่อเพียง 1 บทบาทเท่านั้น
4. ในเรื่องของการพิจารณาด้านจริยธรรมทั้ง 3 บทความ ขอให้ชี้แจงเพิ่มเติมเกี่ยวกับมาตรการคุ้มครองตัวอย่าง เนื่องจากผู้ให้ข้อมูลการวิจัยเป็นนักศึกษาถือว่าเป็นกลุ่มเปราะบาง ดังนั้นควรอธิการเพิ่มเติมว่ามีการดำเนินการอย่างไรเพื่อให้แน่ใจว่าผู้ให้ข้อมูลจะไม่สามารถระบุตัวตนใด ๆ ต่อการศึกษาหรือผลการเรียน
5. แนบเอกสารชี้แจงจากกรรมการจริยธรรมการวิจัย (IRB) สำหรับทั้ง 3 บทความ และจัดวางเอกสารดังกล่าวก่อนแบบฟอร์มประเมินการสอน ไม่ใช่ในช่วงท้ายของเอกสาร นอกจากนี้โปรดตรวจสอบการชี้แจงจาก IRB สำหรับบทความ Using and extended technology acceptance model to determine university students' behavioral intentions of ChatGPT ด้วย

Mrs.Veronica Aguilos Jamieson ได้ดำเนินการแก้ไขและทางคณะฯ ได้ดำเนินการจัดส่งเอกสารให้มหาวิทยาลัย เพื่อดำเนินการต่อไปแล้วนั้น

ต่อมา กองบริหารทรัพยากรบุคคลตรวจสอบแล้ว ขอให้คณะพิจารณาทบทวนวันที่ได้รับเอกสารครบถ้วนสมบูรณ์ เนื่องจากเอกสาร Exemption Justification for IRB Approval ของผลงานทางวิชาการทั้ง 3 เรื่อง ลงวันที่ 28 เมษายน 2568 ซึ่งเป็นวันที่หลังจากส่วนงานรับเรื่อง ประกอบกับมติคณะกรรมการประจำคณะให้ผู้ขอแนบเอกสารชี้แจงจากคณะกรรมการจริยธรรมการวิจัย (IRB) ทั้ง 3 เรื่อง ดังนั้น จึงขอให้คณะกรรมการประจำคณะพิจารณาให้ความเห็นชอบในประเด็นการขอจริยธรรมการวิจัย (IRB) และทบทวนวันแต่งตั้งใหม่อีกครั้ง

ขั้นตอนที่ได้ดำเนินการไปแล้ว

ข้อมูลประกอบการพิจารณา

1. เอกสาร **ลับ** ตามบันทึกที่ มอ 003.4.2/68-1850 ลงวันที่ 17 กรกฎาคม 2568 เรื่อง การขอกำหนดตำแหน่งทางวิชาการ Mrs.Veronica Aguilos Jamieson
2. บันทึกแจ้งแก้ไขเอกสารตามมติคณะกรรมการประจำคณะฯ ตามบันทึกที่ มอ 302.1/68-2167 ลงวันที่ 13 พฤษภาคม 2568
3. ลำดับเหตุการณ์
 - 3.1. Mrs.Veronica ยื่นขอพิจารณากำหนดตำแหน่งทางวิชาการ ตามบันทึกที่ มอ 302.1/68 ลว.13 ก.พ.68 โดยคณะฯ รับเอกสารวันที่ 13 ก.พ.68
 - 3.2 นำเข้าที่ประชุมคณะกรรมการประจำคณะ ครั้งที่ 2/2568 วันที่ 19 ก.พ.68
 - 3.3 แจ้งมติกรรมการคณะฯ ให้ Mrs.Veronica ทราบเพื่อแก้ไขเอกสารตามมติ กรรมการประจำคณะ ตามบันทึกที่ มอ 302/68-0298 ลว. 10 มี.ค.68
 - 3.4 Mrs.Veronica จัดทำเอกสารแก้ไขเอกสารตามมติที่ประชุมกรรมการ ประจำคณะ ตามบันทึกที่ มอ 302.1/68-2167 ลว.13 พ.ค.68

ประเด็นพิจารณา

1. ให้ความเห็นชอบในประเด็นการขอจริยธรรมการวิจัย (IRB)
2. ทบทวนวันแต่งตั้งใหม่อีกครั้ง



ลับ

บันทึกข้อความ

ส่วนงาน งานบริหารทรัพยากรบุคคล กองบริหารทรัพยากรบุคคล โทร 2042

ที่ มอ 003.4.2/68-1850

วันที่ 17 กรกฎาคม 2568

เรื่อง การขอกำหนดตำแหน่งทางวิชาการ ราย MRS.VERONICA AGUILOS JAMIESON

เรียน คณบดีคณะกรรมการบริการและการท่องเที่ยว

ตามบันทึกที่ มอ 300/574 ลงวันที่ 17 มิถุนายน 2568 วิทยาเขตภูเก็ตได้เสนอขอกำหนดตำแหน่งทางวิชาการราย MRS.VERONICA AGUILOS JAMIESON พนักงานมหาวิทยาลัย ให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ สาขาวิชาบริหารธุรกิจ (รหัส 6802) ทั้งนี้ ตั้งแต่วันที่ 13 กุมภาพันธ์ 2568 นั้น

กองบริหารทรัพยากรบุคคลตรวจสอบแล้ว ขอให้คณะกรรมการทบทวนวันที่ได้รับเอกสาร ครบถ้วนสมบูรณ์ เนื่องจากเอกสาร Exemption Justification for IRB Approval ของผลงานทางวิชาการทั้ง 3 เรื่อง ลงวันที่ 28 เมษายน 2568 ซึ่งเป็นวันที่หลังจากส่วนงานรับเรื่อง ประกอบกับมติคณะกรรมการประจำคณะ ให้ผู้ขอแนบเอกสารชี้แจงจากคณะกรรมการจริยธรรมการวิจัย (IRB) ทั้ง 3 เรื่อง ดังนั้น จึงขอให้คณะกรรมการ ประจำคณะพิจารณาให้ความเห็นชอบในประเด็นการขอจริยธรรมการวิจัย (IRB) และทบทวนวันแต่งตั้งใหม่อีกครั้ง

จึงเรียนมาเพื่อโปรดพิจารณาดำเนินการต่อไปด้วย จะขอบคุณยิ่ง

Digitally signed: 2025.07.22 20:53:06 +07:00

(รองศาสตราจารย์ ดร.อุดมพล พิชน์พินทุ์)

รองอธิการบดีฝ่ายทรัพยากรบุคคลและกิจการพิเศษ

ลับ



คณะกรรมาธิการการอุดมศึกษา วิทยาศาสตร์ และ โสภณวิทยา	
ที่รับเรื่อง	038
วันที่รับเรื่อง	18 พ.ค. 68
วันที่	90.30

Memorandum

Organisation: Administrative Office, Faculty of Hospitality and Tourism

No. PSU 302.1/68- 2167

Date 13 May 2025

Subject: Submission of Revised Documents for Academic Title

Dear Dean Dr. Pornpisanu,

Referring to the memorandum No. PSU 302/68-0298 dated March 10, 2025, from the Faculty of Hospitality and Tourism, regarding the result of the evaluation of supporting documents for the academic position application of Mrs. Veronica Aguilos Jamieson, as per the resolution of the Faculty Board Meeting No. 2/2025 held on February 19, 2025.

I would like to respectfully inform you that I have completed the revision of the documents in accordance with the recommendations provided during the aforementioned meeting.

The revisions are as follows:

1. Page numbers and citation counts have been added for each article, and these updates have been reflected in the application form.
2. The essential intellectual contributor has been updated: the field is now left blank for two papers, and Mr. Colin Gallagher is listed as the essential intellectual contributor for one paper following the removal of Asst. Prof. Dr. Kevin Fuchs.
3. The exemption justification for IRB approval has been updated for all papers, with added explanation of the measures taken to protect research participants.
4. The order of documents has been reorganized as follows: first, the exemption justification for IRB approval; second, the academic contribution form; and last, the full article.

Should you require any further information or documentation, please do not hesitate to contact me.

Sincerely,

(Mrs. Veronica Aguilos Jamieson)

Lecturer

Don't forget to sign your name

Don't forget to sign your name

Don't forget to sign your name

Don't forget to sign your name

Don't forget to sign your name

Don't forget to sign your name

Don't forget to sign your name

To: Members of the Subcommittee for Teaching Evaluation

From: Veronica Aguilos Jamieson

Date: 28 April 2025

Subject: Exemption Justification for IRB Approval: Students Behavioral Intentions of ChatGPT

Dear Members of the Subcommittee for Teaching Evaluation,

I hope this note finds you in good spirits. I am writing to formally express my intent to apply for the position of Assistant Professor. As part of the application process, I am submitting a research paper, which is a key requirement for this application, and I kindly seek your consideration in this regard. The details of the paper are as follows:

Title: Using an Extended Technology Acceptance Model (eTAM) to Determine University Students' Behavioral Intentions of ChatGPT: An Empirical Study from Thailand

DOI: <https://doi.org/10.30557/QW000088>

Published: 2024-12-20

In this letter, I am writing to provide justification for why this paper is exempted from requiring Institutional Review Board (IRB) approval based on Section 3 of **Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities**. The paper explores university students' perceptions of using ChatGPT, a Natural Language Processing tool, addressing a contemporary issue in the education and academic industry. Data collection involved a focus group discussion and a survey among university students, all conducted in accordance with strict ethical safeguards to ensure participant protection and research integrity. Below, I outline the ethical measures implemented during the study:

Focus Group Discussion

- **Recruitment:** Participants were randomly selected and invited using a snowball sampling approach. Recruitment and the discussion were conducted during the summer semester. The initial participants invited were enrolled in summer courses, as they were accessible at the time, and they subsequently invited friends to join, some of whom may not have been enrolled in summer classes.
- **Voluntary Participation:** Prior to the focus group, participants were explicitly informed about their right to decline participation before the discussion. The participation was further arranged at their most convenient time, scheduled on a weekend, to ensure it would not interfere with any academic commitments.
- **Informed Consent:** On the day of the discussion, participants were provided with a consent and confidentiality form. This form detailed the purpose of the discussion, assured that personal information would not be disclosed in the study, and stated that only the researchers would have access to their identities. The form also stated that the focus group would be recorded temporarily and deleted once the survey phase was complete.
- **Scope of Discussion:** The focus group aimed solely to gather feedback on the readability, grammar, and language clarity of survey questions in Thai and Chinese. It did not address sensitive topics or issues that could harm participants in any way.
- **Nature of Questions:** The feedback focused on ensuring that the survey questions, based on the Technology Acceptance Model (TAM), were clear and translated correctly.

- **Academic Safeguards:** It was clearly communicated that no academic incentives or penalties would be applied for participation or non-participation in the focus group. Participation had no impact on students' academic standing, grades, or coursework.

Survey

- **Sample Selection:** Students across all levels were invited by randomly visiting classes and sharing a Google Form link.
- **Voluntary Participation:** The introduction to the survey reiterated that participation was voluntary, with no obligation to respond. Answering the survey took less than 10 minutes, and students could complete it at their own time and pace without any disruption to their studies. Participation was entirely voluntary, with no forced mandate imposed.
- **Anonymity and Confidentiality:** The survey explicitly stated that no personal or contact information would be collected, ensuring participant anonymity and confidentiality.
- **Content of the Survey:** The questions, designed using TAM constructs (Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, and Behavioral Intention to Use), explored participants' perceptions of ChatGPT and there were no sensitive or invasive topics.
- **Academic Safeguards:** Students were assured that there would be no academic reward or punishment for completing or declining the survey, and participation or non-participation would not affect their grades or academic standing in any way.

Data Treatment

- No names or personal contact information were recorded or stored.
- The focus group recording was deleted once the survey was distributed.
- Survey responses were archived for potential future research, strictly without any personal details of participants.

This table below provides an overview of how the research aligns with **Section 3: Research Projects in Behavioral Sciences, Social Sciences, and Humanities that Do Not Require Approval from the Institutional Human Research Ethics Committee of the Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities.**¹ It evaluates the specific criteria outlined in the guidelines, highlighting whether the research meets each criterion through a tick box and providing justifications for alignment. The table confirms that the mentioned research above adheres to ethical standards, which exempts the paper from requiring Institutional Review Board (IRB) approval.

Section 3 Criteria	Research met Criteria	Justification
1. Research projects that do not involve actions on the body, mind, cells, cell components, genetic materials, samples, tissues, or bodily fluids of individuals.	✓	This project only involved focus group discussions and surveys without any physical intervention.
2. Research projects involving recorded data in medical records or photographic data of research participants that cannot identify individuals either directly or indirectly.	✓	No recorded data from medical records or photographs were used in this research.
3. Research projects involving surveys, interviews, or observations of research participants that do not involve or impact the mind, cells, cell	✓	The project involved anonymous surveys and a focus group that did not

¹ <https://necast.nrct.go.th/wp-content/uploads/download-manager-files/ประกาศ-แนวทางปฏิบัติในการดำเนินการวิจัยในมนุษย์-ใช้จริง.pdf>

components, genetic materials, samples, tissues, health, or behaviors of participants and cannot identify individuals either directly or indirectly.		include sensitive questions or identifying data.
4. Research projects related to testing the quality, taste, or consumer acceptance of food, provided that the food does not contain unauthorized colorings, additives not approved by law, or substances exceeding safety levels as defined by the Food and Drug Administration.	✓	The research does not involve food testing.
5. Research projects involving the observation of behaviors in communities or society in general, where data collection does not identify individuals either directly or indirectly.	✓	The project involved observing perceptions of ChatGPT usage through anonymous survey responses.
6. Research projects related to training, teaching, or evaluation of educational outcomes that do not impact individuals.	✓	The survey questions were designed based on the Technology Acceptance Model to assess ChatGPT perceptions, with no personal impact on individuals.
7. Other research projects as specified by announcements from the National Research Council of Thailand (NRCT).	✓	This project aligns with the general criteria outlined in Section 3 of the NRCT guidelines.

I trust this letter sufficiently clarifies the alignment of my research with the established guidelines and the ethical measures undertaken. Please do not hesitate to contact me should you require further information or documentation.

Thank you for your time and consideration.

Sincerely,



Veronica Aguilos Jamieson
Lecturer, Faculty of Hospitality and Tourism
Veronica.a@phuket.psu.ac.th
+66 620 589804

Academic Contribution Form

A. Title: Using an extended technology acceptance model to determine university students' behavioral intentions of ChatGPT

B. Applicant's status

✓ First author: Veronica Aguilos (Veronica Aguilos Jamieson)¹

☐ Essentially intellectual contributor:

☐ Corresponding author: Asst. Prof. Kevin Fuchs, Ph.D.

Type of work

Group 1 ✓ Research

Group 2 Other academic works

- | | |
|---|--------------------------------------|
| ☐ Academic work for the industrial sector | ☐ Case Study |
| ☐ Academic work for instructional development | ☐ Translation |
| ☐ Academic work for public policy development | ☐ Patent |
| ☐ Creative work in science and technology | ☐ Software |
| ☐ Dictionary, encyclopedia, nomenclature dictionary, and other similar academic work | |
| ☐ Creative work in esthetics and arts | ☐ Innovation |
| ☐ Academic works for social service | |

Group 3 ☐ Textbook

☐ Book/Monograph

☐ Article

Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

¹ The author, previously published under the maiden name Veronica Aguilos, has changed their name to Verónica Aguilo Jamieson due to marriage

Part 1 Contribution details

The applicant must complete all details in this section. (Since there is no requirement to quantify the ratio of academic contributions, details on roles and responsibilities specified will impact the consideration of their academic work.)

Contribution details	Roles and responsibilities
a. Idea and hypothesis	Veronica and Kevin: Collaboratively brainstormed the initial idea and hypothesis for the study, focusing on the application of ChatGPT in supporting university students. Together, they formulated a research topic that aligned with emerging educational technologies and explored innovative ways to enhance learning outcomes and engagement. Kevin: Proposed using the e-TAM (Extended Technology Acceptance Model) as the framework for the study, providing a structured approach to investigate the factors influencing ChatGPT's adoption and effectiveness.
b. Research operation, involvement in design, experiment, test, measuring tools, data collection methods, and criteria	Veronica and Kevin: Worked together to design the research workflow. During the initial meetings, tasks were distributed, and deadlines were set to ensure the research remained on track. Together, they prepared and presented the research proposal to the research committee of the Faculty of Hospitality and Tourism (FHT) for the Fast Track Grant to support the study. Kevin: Led the proposal development, took charge of communicating with the research team, and ensured the methodology and significance of the study were well-articulated. He also addressed key questions from the committee during the presentation.
c. Data collection, data analysis, and data transformation	Veronica: Took the lead in data collection, organizing and facilitating focus group discussions to ensure survey questions were clear, grammatically correct, and culturally appropriate for Thai and Chinese respondents. Refined the questions based on feedback from the focus groups. Transferred the finalized survey to Google

	Forms and managed its distribution to participants. Kevin: Initially formulated the survey using templates from prior research. Veronica and Kevin: collaborated with professionals and experts to pre-test the survey, address potential biases, and improve its overall validity.
d. Result discussion; display; and comparison with existing conclusions, bodies of knowledge, or theories	Kevin: conducted the statistical analysis of the survey results, discussing key findings with Veronica to ensure mutual understanding and agreement on the outcomes. Veronica and Kevin: divided the result discussion writing based on selected topics. Each author drafted their respective sections, which were later merged to maintain consistency and logical flow throughout the discussion.
e. Involvement in manuscript writing, creative work, innovation, invention, etc.	Veronica: Drafted the Introduction, Literature Review, and Methods sections. While the initial draft for these sections was based on the research proposal, Veronica polished and expanded the content during manuscript preparation. Kevin: Tasked with writing the Results, Discussion, and Conclusion sections. Additionally, Kevin integrated portions of Veronica's contributions to the discussion section to ensure coherence in the final draft.
f. Supportive provision of specimens, study cohorts, logistics, research fund (please specify the source of fund, amount, and year granted), tools, laboratory facilities, and durable articles	Kevin: Handled post-writing tasks, which included liaising with the research team, proofreading the manuscript, and coordinating with publication journals to facilitate submission and publication. Additionally, he took the lead in coordinating with the Faculty, the Phuket campus, and the main campus to secure and collect rewards that supported the research effort.

g. Others	The contributions of Veronica and Kevin to the work are equally divided, with each contributing 50% to the study.
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Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

Part 2 Provide details of the work presentation/display, technology transfer, or knowledge transfer, along with the necessary proof for consideration.

a. Published journal, impact factor, and citation count (database)

QWERTY, Impact Factor of 0.87, Cite Score 2.4 (Scopus Database)²

b. Patent, classification, year of patent, type, and country coverage

c. Technical or research reports and intended audience

d. Publications presented as a poster or oral presentation (the type of session such as plenary, symposium, or oral); conference, fair, or exhibition program booklets (venue and country); or books (publisher name and year of publication)

e. Record of research project funding received concerning this work

Faculty of Hospitality and Tourism Data Collection Grant (Fast Track) - FHT660000002

f. Research receiving a technology transfer, the total licensing fee the researcher received, and proof of the contract

Remark: Please attach any relevant evidence for the items a to f along with this document.

Signature 
(Veronica Aguilos Jamieson)

Applicant

Signature 
(Veronica Aguilos Jamieson)

First author

Signature 
(Asst. Prof. Kevin Fuchs, Ph.D.)
Corresponding author

Using an extended technology acceptance model to determine university students' behavioral intentions of ChatGPT

Veronica Aguilos*, Kevin Fuchs*

DOI: 10.30557/QW000088

Abstract

New technologies have contributed to propel transformations in higher education over the last decade and the emergence of ChatGPT has ignited considerable interest within academia. The study aims to analyze how different factors—perceived usefulness, perceived ease of use, attitude, and subjective norm— shape the behavioral intentions of university students when using ChatGPT in an educational setting. Therefore, the purpose of the study is to examine behavioral intentions of university students in utilizing ChatGPT. To achieve this objective, an extended Technology Acceptance Model has been used. Following a focus group discussion, students were recruited for the data collection using random sampling to investigate the model empirically. The findings revealed an enduring significance of perceived usefulness and ease of use in influencing students' attitudes toward ChatGPT. The article presents implications for theory and practice and advances the discussion about natural language processing models in higher education. Moreover, the study contributes to the body of knowledge by closing a theoretical gap in the literature on university students' behavioral intentions of ChatGPT.

* Prince of Songkla University. Veronica Aguilos,  0009-0006-1200-9645; Kevin Fuchs,  0000-0003-3253-5133

Corresponding author: kevin.f@phuket.psu.ac.th

Keywords: Technology Acceptance Model, ChatGPT, Natural Language Processing Model, TAM, University, Higher Education, Student Behavior

Introduction

In an era marked by rapid technological advancements, the integration of innovative technologies into various aspects of society has become inevitable. Technology has contributed significantly to profound transformations in higher education over the last decade (Benavides et al., 2020). This ongoing evolution is generating considerable interest within the academic community (Chen et al., 2020). Notably, the ascent of the natural language processing model, ChatGPT, has ignited extensive speculation among researchers and educators (Fitria, 2023). ChatGPT stands for Chat Generative Pre-Trained Transformer and is a natural language processing (NLP) model (Fuchs, 2023). It was developed by OpenAI and has the potential capability to revolutionize higher education (Fuchs, 2023). ChatGPT has the capacity to produce responses that resemble human-like interactions when presented with open-ended prompts, including questions, statements, or academic-related inquiries (Kasneci et al., 2023). In an era marked by rapid technological advancements, the integration of innovative technologies into various aspects of society has become inevitable (Machkour & Abriane, 2020). Understanding the factors influencing individuals' acceptance and utilization of these technologies has emerged as a critical concern (Almaiah et al., 2020). One foundational framework that has consistently contributed to unraveling this complex dynamic is the Technology Acceptance Model, or TAM for short (Ali et al., 2020).

ChatGPT's influence on educational systems raises intriguing questions about its potential impact on teaching methodologies, student learning processes, and the broader educational landscape (Tili et al., 2023). As the landscape of technology evolves, it is imperative to adapt TAM to suit the ever-changing technological milieu (Granić & Marangunic, 2019). Over time, different researchers have extended

the model by introducing new variables and further fine-tuning the relationships among them (Granić & Marangunic, 2019). According to Abdel and Al-Yuzbaki (2023), perceived social norms have a significant influence on technology acceptance and usage. These concerns require a comprehensive empirical investigation into university students' behavioral intentions regarding ChatGPT with an adapted version of the TAM with the addition of subjective norms as an additional variable. Consequently, the study aims to analyze how different factors—perceived usefulness, perceived ease of use, attitude, and subjective norm—intersect to influence the behavioral intentions of university students in utilizing ChatGPT within an educational context.

Literature review and hypotheses development

In today's rapidly evolving technological landscape, the Technology Acceptance Model (TAM) has become a cornerstone for understanding why people embrace or resist new technologies (Montargot & Lahouel, 2018). Particularly, since the global pandemic in 2020, educators and students started to (willingly or unwillingly) adapt to digital learning technologies (Bereiter & Sansone, 2022). ChatGPT has markedly influenced educational systems, leading to inquiries about its potential effects on teachers' work methods and students' learning processes. Having charted the journey from the inception of TAM, its extension, the rise of AI and chatbots, and the advent of ChatGPT, it becomes imperative to delve into the core elements that constitute these models and technologies (Kasneci et al., 2023). The constructs of perceived usefulness (PU) and perceived ease of use (PEOU) form the backbone of the TAM, influencing behavioral intentions toward technology use. Perceived usefulness refers to the extent a user believes that using a specific application will enhance their performance (Liaw & Huang, 2013). Liaw and Huang (2013) argue that this belief can significantly influence an individual's attitude toward using technology. On the other hand, perceived ease of use is related to the effort the user believes they must expend to use the application (Yuan et al., 2016).

Prospective users may feel that a system or technology is advantageous while also believing that the system or technology is difficult to use (Kasneci et al., 2023). Therefore, the perceived usefulness and perceived ease of use are crucial parts of the model and significantly shape the user's attitude toward adopting new technology (Mantello et al., 2023; Montargot & Lahouel, 2018). The user's belief in the technology's ability to improve performance (perceived usefulness) and their perception of its ease of use directly impact their overall receptivity towards adopting the technology (Mantello et al., 2023). When users perceive technology as both beneficial and user-friendly, their inclination to embrace it becomes more favorable (Cho & Sagynov, 2015).

H₁. Perceived usefulness significantly impacts the attitude toward using ChatGPT

H₂. Perceived ease of use significantly impacts the attitude toward using ChatGPT

In essence, TAM is a reliable framework for understanding technology adoption (Mantello et al., 2023). However, the extent to which it explains adoption and the significance of different predictor variables can fluctuate depending on the specific samples studied (Scherer & Teo, 2019). Moreover, how easy or difficult a technology is to use significantly affects how users perceive its usefulness (Blut & Wang, 2020). When technology is user-friendly and straightforward, people tend to see it as more practical and beneficial (Ghazali et al., 2018). On the other hand, if a technology is complicated and hard to navigate, users may view it as less useful, leading to reluctance to adopt it (Arif et al., 2020). Therefore, understanding this connection between ease of use and perceived usefulness is crucial for researchers and developers aiming to create user-friendly technologies that are more likely to be embraced by users in different contexts.

H₃. Perceived ease of use significantly impacts the perceived usefulness of ChatGPT

H₄. Perceived usefulness significantly impacts the behavioral intentions of ChatGPT

Over time, different researchers have extended the model by introducing new variables and further fine-tuning the relationships among them (Granić & Marangunic, 2019). A study conducted by Abramson et al. (2015) investigated the usage of e-learning throughout an extended TAM and discovered that perceived ease of use affected attitudes toward usage substantially. In another study, the factor subjective norm was incorporated into the core model to acknowledge societal factors and perceived social norms significantly influencing individual technology acceptance and usage, aiming to present a more comprehensive view of determinants impacting technology adoption (Abdel & Al-Yuzbaki, 2023). Subjective norm is defined as an individual's opinion that the majority of key individuals in his or her life believe he or she should or should not conduct the action in issue (Reynolds et al., 2015). Venkatesh and Davis (2000) mention that subjective norm has a positive effect on an image, which in turn has a positive effect on perceived usefulness and the direct effect of subjective norm on intentions may subside over time with increased system experience.

H₅. Subjective norm significantly impacts the behavioral intentions toward ChatGPT

The role of attitude in the context of technology acceptance is pivotal and therefore said to significantly impact users' behavioral intentions (Chi et al., 2022). Defined within the Technology Acceptance Model (TAM), an attitude reflects a user's positive or negative feelings about performing the target behavior, primarily influenced by the system's perceived usefulness and ease of use (Song, 2019). Empirical studies have substantiated the correlation between a user's attitude toward technology and their intention to use it, indicating that a more favorable attitude often leads to a higher intention to utilize the technology (Abdel-Maksoud, 2018). Furthermore, attitude is influenced by other TAM components, including PU and PEOU, which subsequently affect behavioral intentions (Abdel-Maksoud, 2018). In the context of AI technologies, some studies have demonstrated that us-

ers' attitudes toward these systems can greatly dictate their inclination to utilize them (Song, 2019).

H₆. Attitude significantly impacts the behavioral intentions toward ChatGPT

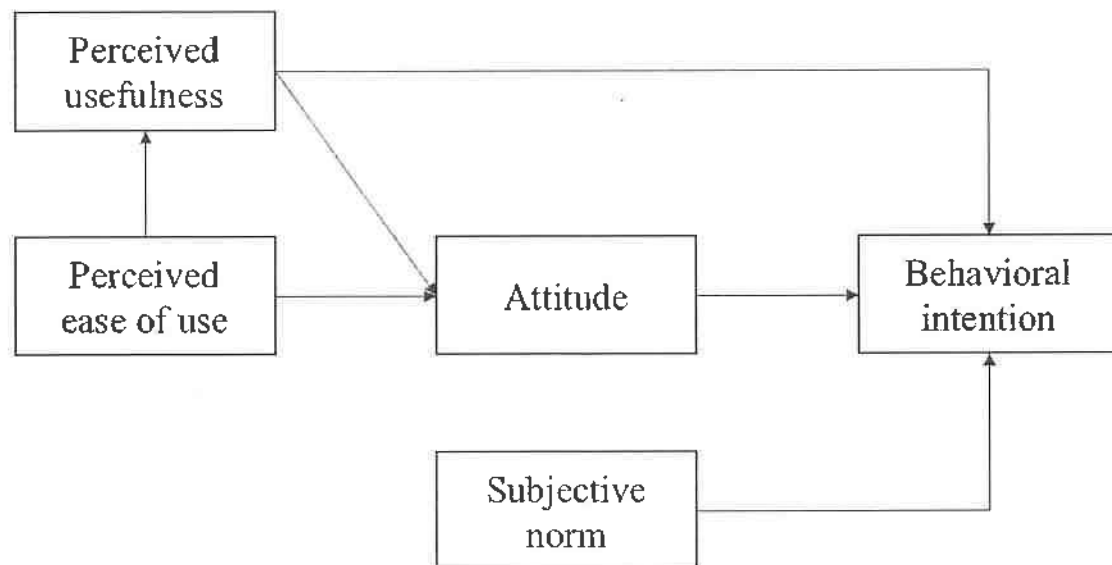
Additionally, as alluded to earlier, ChatGPT has ignited considerable attention in the academic world for its transformative potential in education (Fuchs, 2023). However, it has also raised concerns about its ethical application, academic integrity, and the maintenance of moral values (Fuchs, 2023; Kasneci et al., 2023). It is important to note a limitation in the validity of this claim as the information used does not directly come from educators or students who have used the system. Acknowledging the limitation that the previous claims lacked direct input from educators and students who have experienced the system, there is a potential for the understanding of the system's genuine impact and practical implications to be distorted.

While TAM and eTAM have been extensively applied to a variety of contexts to predict and explain technology acceptance and usage behaviors, their specific application to natural language processing (NLP) technologies within educational settings is an underexplored area (Granić & Marangunić, 2019). This represents a notable gap, given the increasingly pivotal role that NLP technologies, such as chatbots and AI-driven learning tools, play in modern educational contexts (Escotet, 2023). Essentially, the study adopts a conceptual framework by extending the TAM adapted from Lee et al. (2003) as well as Marangunić and Granić (2015) with the factor subjective norm from the Theory of Reasoned Action (TRA) adapted from Madden, Ellen, and Ajzen (1992) as well as LaCaille (2020) with as seen in Figure 1 in order to empirically determine university students' behavioral intentions of ChatGPT.

The application of the eTAM, particularly with the addition of the subjective norm variable, to the study of ChatGPT is compelling and essential (Taherdoost, 2018). Within an educational context, the acceptance and usage of such tools cannot exclusively be predicted by their capabilities in aiding tasks and facilitating learning environment factors (Oke & Fernandes, 2020). This is where the eTAM becomes

Figure 1.

A conceptual framework based on an extended technology acceptance model (eTAM)



especially relevant. Subjective norm, as an additional factor, acknowledges the influence of peers, teachers, or even broader societal perceptions on using AI-based tools like ChatGPT. The complex interplay of these factors — perceived usefulness, perceived ease of use, attitude, and subjective norm — in determining students' behavioral intentions toward ChatGPT makes this a necessary area of research.

Methodology

The objective of this study was to analyze how different factors—perceived usefulness, perceived ease of use, attitude, and subjective norm—intersect to influence the behavioral intentions of university students in utilizing ChatGPT within an educational context. To achieve this goal, we employed an extended Technology Acceptance Model (eTAM) as the methodological framework for empirical investigation. The establishment of a robust and reliable methodological framework involved a series of steps, which have been meticulously undertaken and documented as outlined below.

Focus group discussion

The focus group discussion was organized as a preliminary step in the research process, involving seven undergraduate university students (including three Thai nationals and four Chinese students). Participants were selected by the researcher based on their availability and voluntary acceptance to participate in the discussion. Before proceeding, all participants provided written consent, which included ethical considerations such as confidentiality agreements, voluntary participation, and compensation for their time. The discussion, conducted in a casual environment outside the university, lasted for three hours. Initially, participants were provided with the initial list of survey statements and a Google Form sample and were encouraged to provide individual comments and suggestions. Following this, they engaged in a discussion guided by semi-structured questions about their general experiences with ChatGPT in an educational context. These questions aimed to gain more insights into their usage and the influence of using ChatGPT, potentially uncovering additional questions that might have been missed. The discussion was recorded with their consent.

The intended survey structure consisted of a 5-point Likert scale for evaluating the various factors of the Technology Acceptance Model (TAM) accompanied by sociodemographic questions (available through <https://dx.doi.org/10.6084/m9.figshare.25656315>). Feedback from the focus group, including individual comments and recorded discussions, was thoroughly analyzed using content and narrative analysis. The content analysis enabled the researchers to systematically examine the themes and patterns within the participants' feedback on the survey structure, including the length, complexity, and relevance of the questions. Narrative analysis, on the other hand, facilitated an in-depth understanding of the personal stories and experiences shared by participants regarding ChatGPT. These informative areas may have been overlooked in the initial survey design. The combined use of these analysis methods provided a comprehensive perspective on students' attitudes towards ChatGPT in the educational context. The analysis revealed that the questions

might have been too long and complicated due to limited English skills. Subsequent revisions were made to simplify the survey statements and remove redundancies. Thereafter, the survey statements were translated into Chinese and Thai to facilitate a trilingual survey. These changes were essential for the study, ensuring that the questions and length would be appropriately tailored for the target participants. By aligning the survey with the linguistic needs and comprehension levels of the participants, the refined survey is anticipated to more accurately reflect the behavioral intentions and attitudes toward ChatGPT within the university student population.

Research instrument

The default responses on the 5-point Likert-type scale ranged from 1 [lowest] to 5 [highest], i.e. Strongly Disagree [1], Disagree [2], Neither Agree nor Disagree [3], Agree [4], and Strongly Agree [5]. A five-point Likert scale strikes a balance between granularity and simplicity, making it comprehensible and accessible to participants of varying familiarity, thus reducing the cognitive load (Jebb et al., 2021). The trilingual survey statements – corresponding to the five factors – were adopted from a previous study (Fuchs, 2022) and modified to the context of this study through the focus group discussion. In addition, eight questions sought to establish the sociodemographic profile of the participants as reported in Table 1. The factor *perceived usefulness* (PU) included three statements such as “ChatGPT helps me study and prepare for assignments and other tasks faster”. The variable *perceived ease of use* (PEU) was assessed through four statements including “I can learn to use ChatGPT quickly”. The third factor, *attitude* (AT), was measured through three statements such as “I like doing my assignments, projects, or reports with ChatGPT”. The fourth variable, namely *subjective norm* (SN), was calculated with four statements, including “People close to me agree that I should use ChatGPT in my studies”. Finally, the last variable, *behavioral intentions* (BI), was measured with four statements, including “I expect that I have to use ChatGPT after I graduate from university”.

Data collection and sample

The data collection was carried out using simple random sampling, a probability-based method, in which a subset of participants was randomly chosen from the overall population (Etikan & Bala, 2017). The data collection was conducted with university students on Phuket Island in Thailand between August and September 2023 and responses were collected via a self-administered survey form. After screening the collected data and excluding incomplete data from inclusion the final sample included 135 responses to represent the population in data analysis. King and He (2006) note that a recommended sample of 225 is desirable to determine correlations using the Technology Acceptance Model, however, Deng et al. (2005) state that a minimum of 100 is required. Therefore, the achieved sample of 135 for this study was considered adequate. Based on eligible responses, the sociodemographic profile of the participants was summarized in Table 1 (including the respondents' gender, year of study, age range, nationality, place

Table 1.

Sociodemographic profile of the sampled population

Characteristic		Frequency	Percentage
Gender	Female	79	59%
	Male	56	41%
Nationality	Thai	92	68%
	Foreign	43	32%
Degree Level	Bachelor's Degree	125	93%
	Master's Degree	10	7%
Study Major	Tourism & Hospitality	97	72%
	Computer & Technology	18	13%
	Business & Economics	12	9%
	Others	8	6%
Year of Study	Year 1	6	4%
	Year 2	51	38%
	Year 3	20	15%
	Year 4 or above	58	43%

Note. The average age of the participants was 21.65 years with a standard deviation (SD) of 4.208

of study, and study major). To protect the identity of the participants, some specific information in the sociodemographic profile was generalized before disclosure in this paper, namely minority nationalities were grouped as “foreign” instead of displaying the particular nationality as this could potentially allow exposing the identity of the participant.

Results and analysis

SPSS (Statistical Package for the Social Sciences) Version 27 was employed for the execution of an array of statistical analyses. Initially, the computation of mean values (represented as μx) and standard deviations (represented as σ) was performed for each respective statement. Subsequently, an evaluation of internal consistency and reliability was conducted utilizing Cronbach’s alpha, followed by an assessment of construct validity through factor analysis. In pursuit of the research objectives, linear correlation analysis was employed to discern statistically significant correlations using the Pearson correlation coefficient.

Principal factor analysis and reliability test

The initial phase of the statistical analysis involved assessing the reliability and construct validity. The measurement aimed to establish internal consistency across the variables to establish robust internal validity. An alpha of more than 0.7 would indicate that the items are homogeneous and measure the same constant (Barbera et al., 2020). Although Cronbach’s alpha coefficients within the range of 0.6 to 0.7 were considered the lower threshold of acceptability, denoting the requisite homogeneity among items (Barbera et al., 2020). The Cronbach’s alpha scores ranged from 0.736 to 0.786 (as reported in Table 2) and therefore exceeded the recommended threshold, confirming the survey’s internal consistency and hence denoting a high reliability. To evaluate the construct validity, a factor analysis was conducted.

Utilizing a principal factor analysis approach with varimax rotation, the analysis targeted the underlying structure of the 18 items

comprising the survey (namely, perceived usefulness, perceived ease of use, attitude, subjective norms, and behavioral intentions). The outcomes of this analysis indicated that the first factor accounted for 14.7% of the total variance, followed by the second factor for 13.2%, the third factor for 18.5%, the fourth for 11.9%, and lastly, the fifth for 18.4% of the total variance. The tabulated results present the factor loadings after rotation, with those below the 0.60 thresholds omitted for enhanced clarity (Table 2). Notably, all the obtained factor loadings surpassed the 0.6 threshold, attesting to a robust convergent validity (Zinbarg et al., 2005). This analysis affirms the unidimensional nature of each construct, with individual items aligning predominantly with a single factor, further affirming the construct's distinctiveness.

Table 2.

Results of principal factor analysis and reliability test for internal consistency

Scale Item	Mean	SD	Cronbach's alpha	F1	F2	F3	F4	F5
PEU1	3.963	0.950	0.752	0.819				
PEU2	3.844	0.897		0.812				
PEU4	3.674	1.014		0.752				
PEU5	4.015	0.922		0.651				
PU1	3.741	0.828	0.776		0.822			
PU2	4.081	0.947			0.854			
PU4	3.830	1.103			0.828			
AT1	3.296	0.978	0.736			0.794		
AT2	3.541	1.056				0.863		
AT3	3.593	1.053				0.770		
SN1	3.363	0.927	0.738				0.755	
SN2	3.911	0.934					0.618	
SN3	2.956	1.152					0.832	
SN4	3.163	1.073					0.777	
BI1	3.889	0.895	0.786					0.806
BI2	3.770	0.992						0.797
BI4	4.207	0.955						0.696
BI5	3.830	1.048						0.822
% of variance explained				14.7	13.2	18.5	11.9	18.4
Cumulative percentages				14.7	27.9	46.4	58.3	76.7

Note. Principal axis factoring was used with varimax rotation, rotation converged in four iterations.

^a Factors: EU = Perceived Ease of Use; PU = Perceived Usefulness; AT = Attitude, SN = Subjective Norms, BI = Behavioral Intentions

Linear correlation analysis

In the next phase, the Pearson correlation coefficient was calculated, and the results are reported in Table 3 and Figure 2. The Pearson correlation coefficient requirements were all consistent and based on best practices by Benesty et al (2009). Altogether, all six pair-wise combinations have a statistically significant relationship ($p < .001$). According to Benesty et al. (2009) and Schober et al. (2018), an r -value between 0.1 and 0.39 indicates a minor positive correlation, whereas an r -value between 0.40 and 0.69 indicates a moderate positive connection. Finally, a strong positive correlation has an r -value of 0.7 or above. Based on the six pair-wise combinations, a moderate correlation exists between all six relationships ranging from 0.484 to 0.630 in strength. Namely, the different strengths resulted in the following measures: *Perceived usefulness* and *attitude* (.630, $p < .001$), *perceived ease of use* and *attitude* (.484, $p < .001$), *perceived ease of use* and *perceived usefulness* (.516, $p < .001$), *perceived usefulness* and *behavioral intentions* (.546, $p < .001$), *subjective norm* and *behavioral intentions* (.570, $p < .001$), and finally, *attitude* and *behavioral intentions* (.517, $p < .001$). Table 3 also includes the results of the Shapiro-Wilk test for bivariate normality and indicates that the result does not significantly deviate from a normal distribution.

Table 3.
Pearson's correlation (r) analysis

Pair-wise correlation	r	p	Lower 95% CI	Upper 95% CI	Shapiro-Wilk
PU $\rightarrow$ AT	0.630 *	$< .001$	0.516	0.722	0.969
PEU $\rightarrow$ AT	0.484 *	$< .001$	0.343	0.603	0.966
PEU $\rightarrow$ PU	0.516 *	$< .001$	0.380	0.630	0.967
PU $\rightarrow$ BI	0.546 *	$< .001$	0.461	0.655	0.958
SN $\rightarrow$ BI	0.570 *	$< .001$	0.444	0.674	0.956
AT $\rightarrow$ BI	0.517 *	$< .001$	0.382	0.631	0.962

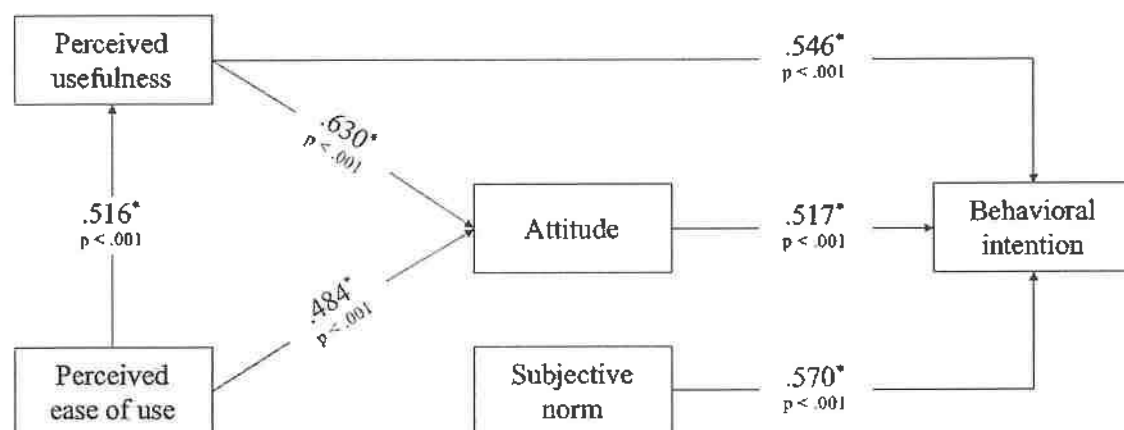
Note. The analysis is based on the conceptual model influencing students' behavioral intentions of using ChatGPT for their university studies

* $p < .001$ indicating a statistically significant collection between the factors. ^b Factors: EU = Perceived Ease of Use; PU = Perceived Usefulness; AT = Attitude, SN = Subjective Norms, BI = Behavioral Intentions

The model highlights the statistically significant relationship between the variables. To sum up, there is a statistically significant correlation ($p < .001$) for all relationships within the model, and therefore, all six hypotheses are confirmed and thus can be accepted. Furthermore, the observed correlation between the six variables demonstrated a moderate strength varying between 0.484 to 0.630.

Figure 2.

The result of the regression analysis indicates the strength of the relationship among the variables



Discussion and implications

The objective of this study was to analyze how different factors—perceived usefulness, perceived ease of use, attitude, and subjective norm—intersect to influence the behavioral intentions of university students in utilizing ChatGPT within an educational context. All the pair-wise correlations, ranging from 0.484 to 0.630, fall within the moderate strength category. This suggests that each of these constructs has a meaningful and moderate influence on each other (Benesty et al., 2009). The strongest relationship is observed between perceived usefulness (PU) and attitude (AT) with an R-value of 0.630. This shows that students' perceptions of the usefulness of ChatGPT play a significant role in shaping their attitudes towards it. In this case, students notice its distinct advantages. This leads them to develop

a more positive view of the platform. To support this statement, a hospitality and tourism management student mentioned in the open comment field of the survey that “it can be useful in terms of processing the pattern of idea in many different ways in Chat GPT. Unlike Google [search], Chat GPT is more likely to give a clearer answer”. This sentiment is in line with the principles of the Technology Acceptance Model (Kamal et al., 2020) which suggests that the way users see the usefulness of a technology can directly impact their willingness to use it. In essence, when students see the benefits of ChatGPT in their academic journey, their eagerness to engage with it increases. Highlighting the tangible benefits of such technologies becomes crucial in promoting a positive user perspective.

The evident connection between perceived usefulness (PU) and attitude (AT) suggests a broader implication: Students likely perceive ChatGPT as a tool that can significantly enhance their learning journey. This perception is likely rooted in ChatGPT’s capabilities to offer immediate, comprehensive, and tailored feedback, transforming the learning process into a more dynamic and immersive experience (Fitria, 2023; Fuchs, 2022). Echoing this sentiment, a male student remarked, “I might use ChatGPT to assist with a wide range of tasks, such as answering questions, brainstorming ideas, generating content, learning new topics, practicing language skills, and more. It is a versatile tool that can provide helpful insights and information in a conversational manner.” Such firsthand accounts underscore the potential of ChatGPT as a multifaceted educational aid, aligning with broader research on the benefits of interactive learning tools (Saleem et al., 2022).

Transparency and ethical awareness are paramount in the integration of AI technologies like ChatGPT into higher education (Rios-Campos et al., 2023). To effectively address these considerations, educational institutions must establish clear ethical guidelines that explicitly define the scope and limitations of AI usage within academia (Rios-Campos et al., 2023). Such guidelines should encompass issues related to academic integrity, privacy, and responsible AI utilization (Cathrin & Wikandaru, 2023). Simultaneously, institutions should actively promote ethical awareness and open discussions within the

academic community. By openly acknowledging the capabilities and limitations of ChatGPT and other NLP models, universities foster a culture of transparency, ensuring that both educators and students comprehend the role of AI in education fully. This transparency enables students to make informed decisions regarding their engagement with AI technologies and sets clear expectations for responsible usage.

Moreover, there are other implications deriving from the study. It is noteworthy to mention that the findings from this study contribute to the existing literature on the Technology Acceptance Model (TAM) by reaffirming the enduring importance of perceived usefulness and perceived ease of use as pivotal determinants in influencing behavioral intentions. The study's findings underscore the robustness of these foundational TAM constructs in the context of ChatGPT adoption within higher education. Moreover, the study identifies the critical role of social norms (as introduced through the Extended Technology Acceptance Model) in shaping technology acceptance and behavioral intentions. These theoretical implications not only enhance our understanding of the core TAM constructs but also advocate for the continued examination of the evolving socio-cultural factors that play a crucial role in shaping technology acceptance behaviors, thus fostering a more comprehensive and dynamic framework for studying technology adoption in the modern era.

Conclusion and future research

The study aimed to investigate university students' Chat Generative Pre-Trained Transformer (ChatGPT) adoption intentions within higher education using an Extended Technology Acceptance Model (eTAM). Key findings underscore the enduring significance of perceived usefulness and ease of use in influencing students' attitudes toward ChatGPT. The inclusion of subjective norms in the eTAM highlights the pivotal role of social influences on technology acceptance within education. These insights emphasize the importance of a holistic approach to technology adoption, considering both technical and socio-cultural factors. Moreover, the limitations of this study offer

potential areas for future research. For instance, comparative studies conducted in different geographical settings could better assess the impact of social norms on perceived behavioral intention toward ChatGPT adoption. Understanding how cultural factors shape technology acceptance can inform tailored strategies for AI integration in diverse educational contexts. Future research should strive for larger and more diverse samples, ensuring enhanced generalizability of findings to a broader student population and strengthening the foundation for informed decision-making in the realm of AI technology adoption within academia. Lastly, the statistical analysis conducted on the survey instrument affirms its reliability and validity. Such robustness in the instrument's design and structure ensures that the findings derived from it are trustworthy and can be used confidently to draw meaningful conclusions. Future studies can also consider using this instrument, given its demonstrated reliability and validity, to explore similar research questions or contexts.

Etichal Aspects

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To: Members of the Subcommittee for Teaching Evaluation

From: Veronica Aguilos Jamieson

Date: 28 April 2025

Subject: Exemption Justification for IRB Approval: Student Perceptions on LMS Gamification Study

Dear Members of the Subcommittee for Teaching Evaluation,

I trust this message reaches you in good health and high spirits. I am writing to provide clarification and request your consideration regarding my research paper, which is part of the submission requirements for my application for assistant professorship. The details of the paper are as follows:

Title: The Perceived Usefulness of Gamified E-Learning: A Study of Undergraduate Students with Implications for Higher Education

DOI: <https://doi.org/10.3389/feduc.2022.945536>

Published: 6 July 2022

In this letter, I am writing to provide justification for why this paper is exempted from requiring Institutional Review Board (IRB) approval based on Section 3 of **Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities**. The paper examines university students' perceptions and experiences with game-like features integrated into their current Learning Management System (LMS). It aims to evaluate whether these features motivate students, enhance their knowledge, or elevate their overall learning experience in the context of higher education. The paper involves a study where participants were invited using a snowball sampling technique to use a learning management system we developed, containing a short course on hospitality. I would like to highlight the ethical safeguards implemented throughout the research process:

Learning Management System Use

- **Recruitment:** Students were recruited through snowball sampling. The initial student approached had previously been enrolled in classes with both researchers. This student then invited classmates and peers to participate, some of whom had no direct academic relationship with the researchers. Importantly, all participating students were former students, not currently enrolled in any classes with the researchers at the time of the study.
- **Voluntary Participation:** Students were informed that their participation was voluntary, with no obligation to participate. It was emphasized that there would be no academic incentives, rewards, penalties, or impact on their grades or academic standing resulting from participation or non-participation.
- **Scheduling and Academic Protection:** The online learning sessions were scheduled based on students' availability to ensure that no participant had to miss any regular academic classes or obligations. Each session lasted approximately 90 minutes, with 30 minutes for introductions and instructions, and 60 minutes for students to progress through the self-paced course. Students were allowed to leave once they completed the course.
- **Anonymity and Confidentiality:** Participants were assured that their identities would not be disclosed and that only the researchers would have access to their personal information.
- **Non-Sensitive Content:** The short course content focused solely on hospitality knowledge and did not include any sensitive information.

Post-Course Interviews

- **Voluntary Participation:** After completing the course, participants were asked if they would be willing to participate in an interview. They were informed that their participation in the interview was voluntary and that they could decline without any repercussions.
- **Informed Consent:** Participants who agreed to the interview were provided with a detailed consent form. The form outlined the purpose of the interview, the voluntary nature of participation, and the confidentiality protections in place. Participants were also informed of their right to withdraw at any time, without consequence.
- **Scope of Questions:** The interview focused on participants' perceptions and experiences with the online course, including feedback on the user interface and system functionalities. No sensitive or invasive questions were asked, as the discussion was limited to educational purposes.

Data Treatment

- No names or personal contact information were recorded or stored.
- The logs and other content from the LMS were destroyed after a year together with the website.
- The recorded audio and transcript of interviews were destroyed after the research was completed and published.

This table below provides an overview of how the research aligns with **Section 3: Research Projects in Behavioral Sciences, Social Sciences, and Humanities that Do Not Require Approval from the Institutional Human Research Ethics Committee of the Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities.**¹ It evaluates the specific criteria outlined in the guidelines, highlighting whether the research meets each criterion through a tick box and providing justifications for alignment. The table confirms that the mentioned research above adheres to ethical standards, which exempts the paper from requiring Institutional Review Board (IRB) approval.

Section 3 Criteria	Research met Criteria	Justification
1. Research projects that do not involve actions on the body, mind, cells, cell components, genetic materials, samples, tissues, or bodily fluids of individuals.	✓	The study focuses on educational perceptions and experiences, avoiding any interventions on the participants' body, mind, cells, or health.
2. Research projects involving recorded data in medical records or photographic data of research participants that cannot identify individuals either directly or indirectly.	✓	No recorded data from medical records or photographs were used in this research. All participant information was anonymized, and no direct or indirect identifiers were recorded.
3. Research projects involving surveys, interviews, or observations of research participants that do not involve or impact the mind, cells, cell components, genetic materials, samples, tissues, health, or behaviors of	✓	The study's survey and post-course interviews focused exclusively on participants' perceptions of the LMS's game-like features. No sensitive or behavioral interventions were involved.

¹ <https://necast.nrct.go.th/wp-content/uploads/download-manager-files/ประกาศ-แนวทางปฏิบัติในการดำเนินการวิจัยในมนุษย์-ใช้จริง.pdf>

participants and cannot identify individuals either directly or indirectly.		
4. Research projects related to testing the quality, taste, or consumer acceptance of food, provided that the food does not contain unauthorized colorings, additives not approved by law, or substances exceeding safety levels as defined by the Food and Drug Administration.	✓	The research does not involve food testing.
5. Research projects involving the observation of behaviors in communities or society in general, where data collection does not identify individuals either directly or indirectly.	✓	The research involves observing and analyzing the general perceptions and behaviors of university students interacting with the LMS. No personally identifiable data was collected.
6. Research projects related to training, teaching, or evaluation of educational outcomes that do not impact individuals.	✓	The study pertains to evaluating educational outcomes and experiences through the use of a non-invasive, anonymous LMS short course on hospitality knowledge.
7. Other research projects as specified by announcements from the National Research Council of Thailand (NRCT).	✓	This project aligns with the general criteria outlined in Section 3 of the NRCT guidelines.

I kindly request the committee to proceed with evaluating my research paper as part of my application for the position of assistant professor, taking into account the ethical measures implemented in the absence of an IRB certificate. I want to emphasize that every effort was made to uphold the rights and well-being of the participants throughout the research process.

Thank you for your understanding and consideration. Should you require any additional information or clarification, I would be happy to provide it.

Sincerely,



Veronica Aguilos Jamieson
Lecturer, Faculty of Hospitality and Tourism

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Academic Contribution Form

A. Title: The Perceived Usefulness of Gamified E-learning: A Study of Undergraduate Students with Implications for Higher Education

B. Applicant's status

✓ First author: Veronica Aguilos (Veronica Aguilos Jamieson)¹

☐ Essentially intellectual contributor:

☐ Corresponding author: Asst. Prof. Kevin Fuchs, Ph.D.

Type of work

Group 1 ✓ Research

Group 2 Other academic works

- | | |
|---|--------------------------------------|
| ☐ Academic work for the industrial sector | ☐ Case Study |
| ☐ Academic work for instructional development | ☐ Translation |
| ☐ Academic work for public policy development | ☐ Patent |
| ☐ Creative work in science and technology | ☐ Software |
| ☐ Dictionary, encyclopedia, nomenclature dictionary, and other similar academic work | |
| ☐ Creative work in esthetics and arts | ☐ Innovation |
| ☐ Academic works for social service | |

Group 3 ☐ Textbook

- ☐ Book/Monograph
- ☐ Article

Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

¹ The author, previously published under the maiden name Veronica Aguilos has changed their name to Veronica Aguilos Jamieson due to marriage

Part 1 Contribution details

The applicant must complete all details in this section. (Since there is no requirement to quantify the ratio of academic contributions, details on roles and responsibilities specified will impact the consideration of their academic work.)

Contribution details	Roles and responsibilities
a. Idea and hypothesis	Kevin and Veronica:, Collaboratively brainstormed potential applications of gamification in educational settings. They jointly conceptualized the idea of applying gamification to short courses designed for hospitality students from the Faculty of Hospitality and Tourism (FHT).
b. Research operation, involvement in design, experiment, test, measuring tools, data collection methods, and criteria	Veronica: Took the lead in developing and managing a standalone Learning Management System (LMS), modeled after PSU LMS, to ensure the confidentiality of the research. Utilized her programming skills and modified Moodle LMS to integrate gamification features. She also curated and designed the course content, creating an introductory course on hospitality management. The course included lecture slides, quizzes, and short seatwork activities, all enhanced with gamification elements.
c. Data collection, data analysis, and data transformation	Veronica: Managed the data collection process. Gathered log data from the LMS and summarized the findings; invited participants to enroll in the course and conducted semi structured post-course interviews; transcribed the interview recordings and utilized Miro to identify and formulate key themes from the qualitative data. The identified themes were then shared with Kevin for further discussion.
d. Result discussion; display; and comparison with existing conclusions, bodies of knowledge, or theories	Veronica and Kevin: Discussed and interpreted of the themes derived from the interviews. Veronica: Took the initiative to draft the results and discussion section, providing a foundation for the final manuscript.

e. Involvement in manuscript writing, creative work, innovation, invention, etc.	Veronica: Wrote the Introduction, Literature Review, and Methods sections during the proposal phase, updating them after data collection. She also initiated the drafting of the Results and Discussion section. Kevin: Once her initial draft was complete, refined and expanded the discussion, ensuring coherence and depth. Formatted the document for pre-publication submission.
f. Supportive provision of specimens, study cohorts, logistics, research fund (please specify the source of fund, amount, and year granted), tools, laboratory facilities, and durable articles	Veronica: As the lead researcher, handled communication with the research committee to secure the grant. The research received a Fast Track Grant from the FHT Research Committee. Upon receiving revisions from the publisher, she contributed by reviewing and providing minor updates to the revisions. Kevin: supported this process, maintaining communication with the committee after the manuscript's submission. Kevin also managed the rewards processing from the faculty (Phuket campus and main campus) and acted as the corresponding author. Upon receiving revisions from the publisher, Kevin drafted the required updates and justifications.
g. Others	Both researchers contributed significantly to the project's success, ensuring a collaborative effort throughout the research lifecycle. Their combined expertise and dedication were instrumental in achieving the research objectives and securing publication.

Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

Part 2 Provide details of the work presentation/display, technology transfer, or knowledge transfer, along with the necessary proof for consideration.

a. Published journal, impact factor, and citation count (database)

Frontiers in Education, Impact Factor of 1.9, Cite Score 2.9 (Scopus)²

b. Patent, classification, year of patent, type, and country coverage

.....

c. Technical or research reports and intended audience

.....

d. Publications presented as a poster or oral presentation (the type of session such as plenary, symposium, or oral); conference, fair, or exhibition program booklets (venue and country); or books (publisher name and year of publication)

.....

e. Record of research project funding received concerning this work

Faculty of Hospitality and Tourism – Data Collection Grant (Fast Track) - FHT64000014

f. Research receiving a technology transfer, the total licensing fee the researcher received, and proof of the contract

.....

Remark: Please attach any relevant evidence for the items a to f along with this document.

Signature 

(Veronica Aguilos Jamieson)

Applicant

Signature 

(Veronica Aguilos Jamieson)

First author

Signature 

(Asst. Prof. Kevin Fuchs, Ph.D.)

Corresponding author



The Perceived Usefulness of Gamified E-Learning: A Study of Undergraduate Students With Implications for Higher Education

Veronica Aguilos and Kevin Fuchs*

Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket, Thailand

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Gamification is about applying gaming strategies and game elements to improve learning, and thus, making it more engaging for individuals. The application of gamification in higher education aims to incentivize students and is said to improve the efficiency of self-paced learning. The study aims to explore the perceived usefulness and challenges of gamified learning in the context of a massive open online course. A qualitative exploratory study design was adopted to collect empirical data from 19 undergraduate students about their experiences with gamified learning. An inductive approach was used to interpret the results thematically. A total of four themes emerged from the data analysis. The collected data revealed that Students' competitive behavior has a significant effect on Students' marks in the activities. Moreover, instant gratification from immediate feedback and evaluation was perceived as highly motivating for the students. The article concludes by presenting implications for educators, policymakers, and education researchers derived from the academic and practical discussions based on the findings.

Keywords: gamification, tourism education, student engagement, online learning, technology-enhanced learning, learning management systems

INTRODUCTION

Gamification of e-learning has created a lot of speculation in higher education (Hung et al., 2017), although traditional face-to-face learning is the common practice in most universities across Thailand (Wongwuttawat et al., 2020). According to Evans and Myrick (2015) and Kannadhasan et al. (2020), most institutions in higher education were embracing technology and slowly started adapting to online learning due to the popularity of massive open online courses (MOOC). However, due to the outbreak of the coronavirus pandemic (SARS-CoV-2 or COVID-19), there was a sudden and drastic shift toward online education (Fuchs and Karkila, 2021). Institutions in higher education across Thailand were required to apply emergency remote teaching to provide students with continuity for their university studies (Fuchs and Karkila, 2022). There was minimal time to explore and train educators to shift entirely to online education (Hodges et al., 2020). As a result, a new set of challenges emerged and educational institutions needed to address them quickly.

The gamification of learning is an educational approach that seeks to motivate students by using video game design and game elements in learning environments (Monterrat et al., 2017). Gamified learning has the potential to increase learners' engagement (Mohamad et al., 2018) and the quality of learning (Sailer et al., 2017). Moreover, gamification is said to

foster human motivation and performance concerning a given activity (Díaz-Ramírez, 2020). The research trend on this topic shows an increasing number of empirical studies (Rodríguez et al., 2019). Moreover, the paradigm of online education, or e-learning for short, has experienced tremendous growth in previous years, in particular during the coronavirus pandemic (Alqahtani and Rajkhan, 2020). Traditionally, higher educational institutions in Thailand have been more reluctant to adopt e-learning strategies compared with Western universities in Europe or North America (Kew et al., 2018). However, the increased application of e-learning during COVID-19 narrowed the gap, and educators and institutions in Thailand are looking for meaningful e-learning pedagogies and strategies (Wongwattiwat et al., 2020).

Research Aim and Question

The study aims to contribute to the body of knowledge by critically exploring how undergraduate students in Thailand perceive gamification. Furthermore, the study aims to provide practical implications for institutions in higher education to implement gamified learning, and therefore, improve the quality of education. Lastly, the study is guided by the following research questions “How do undergraduate students perceive gamification as part of their learning experience during their tertiary education?”

LITERATURE REVIEW

Gamification of Learning¹

Gamification has been on a significant rise since 2014 (Zaric et al., 2017) and is defined as applying game design principles in non-gaming contexts (Robson et al., 2015, 2016) to motivate and interact with users (Hassan et al., 2019). Its developing popularity can be credited to several factors: the desire to foster motivation, change in behavior, equal competition, and customer loyalty. In literal terms, gamification is all about making something that may be potentially tiresome into a game model to make it much more exciting and fun. According to Bernik et al. (2017), gamification involves pursuing a routine practice or activity and incorporating various gaming mechanics, such as awarding experience badges, points, and the levels of the completion practices and leaderboards. One major field that has put gamification techniques into proper use has been the education sector.

Gamification in the education sector refers to the utilization of various gaming elements and gaming experiences during learning procedures (Sailer et al., 2017; Alshammari, 2020). Gamification has been developed to support learning in several ways as well as subject areas. The main idea here has been that it is possible to incorporate gaming techniques in the context of a learning procedure to engage the learners productively and behave in such a great way (Annansingh, 2018). Gamification of learning

is one of the most significant modern concepts and has been an emerging concept in research (Hassan et al., 2019). There is increasing proof that gamified learning is widely recognized as a useful teaching tool for constructing attractive learning environments (Saleem et al., 2021).

Gamification Techniques Applied in Formal Learning

Caton and Greenhill's (2015) research on a gamified framework to improve attendance and participation in an undergraduate project used awards and punishment as game elements. They had two groups of students with and without a gamified framework by which they compared the groups' performance, attendance, and participation. Their research shows that attendance during the awarding day was 16% higher than during the control year, which indicated that students were motivated by the chance of winning the award. A higher percentage of students from the gamified group performed well based on their grades and the production of outstanding final projects compared to the group without the gamified framework. Moreover, they concluded that the penalty system proved to be effective in improving participation and attendance.

Gamified learning in higher education found that awards and penalties throughout the semester effectively motivate disengaged students (Subhash and Cadney, 2018). Most studies have incorporated comparison-based approaches to assess and measure student engagement in studies correctly. Findings in these studies matched the proper way that gamification tends to affect the Student's engagement in learning positively (Zaric et al., 2017). Boudadi and Gutiérrez-Colón (2020) conducted a meta-analysis to explore relevant empirical research published between 2011 and 2019. After reviewing a corpus of 68 papers, they concluded that the sentiment toward gamification—from the learner and teacher perspectives—were mostly positive. However, both authors also claimed that empirical evidence is still very limited and more empirical studies in higher education are required to access the perceived usefulness (Boudadi and Gutiérrez-Colón, 2020).

The technology acceptance model (TAM) is a conceptual model to access how students come to accept and use a technology (Granić and Marangunić, 2019). TAM's core variables, perceived ease of use and perceived usefulness, have been proven to be significant factors affecting the acceptance of learning with technology (Scherer et al., 2019). However, before conducting confirmatory research (i.e., hypothesis testing), it is important to gather meaningful and rich information with the ability to identify a relationship between the phenomena, educational context, and the students using gamified learning. In related research, Poondei and Lerdpornkulrat (2019) used student interaction data to investigate the frequency of online interaction with the gamified online course content. The authors concluded that gamified learning had positive impacts toward course engagement, however, they were unable to identify the contributing intrinsic factors (Poondei and Lerdpornkulrat, 2019).

¹ Although marginal differences exist in the interpretation of different terminology related to gamified learning, the authors would like to state that the terms “gamification of learning,” “gamified learning,” “gamification of online learning,” or “gamification in formal learning” as used interchangeably in context of this article.

Online Learning During the COVID-19 Pandemic

To continue learning safely and maintain student enrollment during the recent COVID-19 pandemic, higher education institutions abruptly moved to online learning. Due to the drastic shift from face-to-face classes to online classes, many institutions applied hybrid or blended learning methods. According to Reed (2020), hybrid learning combines traditional face-to-face instruction with additional offline or distance learning techniques, while blended learning uses online instruction to complement or supplement traditional face-to-face instruction, not replace it. According to O'Byrne and Pytash (2015), hybrid and blended learning are often interchangeable, but hybrid learning is often used. The same research mentioned that hybrid learning gives opportunities for educators to provide personalized lessons and students have more control over their lesson path, pace, time, and place. Moreover, students are generally averse to online teaching if given a choice between studying online and studying on-site (Fuchs, 2021).

The abrupt shift to online learning, especially for institutions with less experience in online learning, resulted in limited time to explore and train for effective online teaching. Dhawan's (2020) study mentioned a few problems associated with online learning: technology such as downloading errors, audio and video errors, a lower engagement rate from students, Students' attention span, teacher-student interactions, and distractions, amongst others. It also mentioned challenges the institution can face, such as ICT infrastructure, quality of education, digital literacy, and technology cost and obsolescence.

Gamification of Online Learning

In online learning, gamification has been cited as one of the most exciting and exciting eLearning technology trends (Annansingh, 2018). Utilizing the various gamification techniques in online learning is unique and distinct from teaching on a face-to-face learning model whereby the instructor can manage and organize the students more instantly. Online learning tools or platforms such as Learning Management System or LMS, has a significant role to play in developing gamification (Zaric et al., 2017). Numerous LMS alternatives are available in the market today and have gamification elements (Hassan et al., 2019). Moodle is the most popular. It is a well distinguished open-source LMS utilized effectively by instructors all over the world to deliver online learning (Annansingh, 2018). As much as Moodle gives various features that aid in gamification in learning, there is a need for experiences in incorporating such elements into the available course requirements.

A study conducted by Alshammari (2020) implemented and assessed a Moodle gamified online learning environment intending to enhance student engagement in online learning. Other studies suggest that limited empirical research has been carried out on implementing the various elements and features in the Moodle platform. These studies implemented gamification features with points, badges, and leaderboards being the most common game features incorporated (Zaric et al., 2017). In the full implementation of gamification, Moodle's most popular

game features are the digital badge, whereas other add-on software tools utilize other game features (Hassan et al., 2019). Furthermore, limited studies have attempted to survey the user perceptions of implementing the game features in Moodle. Thus far, only one study has alluded to the reward of digital badges as an important idea and concept in e-learning where there has been no notable standard grading system (Alshammari, 2020).

METHODOLOGY

Study Design

A qualitative study design has been adopted based on good practice (Aspers and Corte, 2019). A qualitative methodology is a suitable approach to collecting rich, nuanced, and meaningful data to answer a relatively unknown phenomenon (Hammarberg et al., 2016). Therefore, an exploratory research approach has been applied to gather empirical interview data. The data was gathered through a combination of focus group discussions as well as semi-structured interviews. Semi-structured interviews encourage two-way communication while providing an opportunity for the informants to express their views on their terms (McIntosh and Morse, 2015). Furthermore, focus group discussions are moderated interviews with a small group of people to find out the perceptions and attitudes of the participants (Nyumba et al., 2018).

Sample

The sample included Thai and international undergraduate students majoring in hospitality and tourism management. Furthermore, the students were full-time students studying toward a Bachelor of Business Administration. The age of the participating students ranged from 18 to 22 years old. All participants had a basic knowledge of Moodle; the Learning Management System (LMS) through their university-related coursework. The first batch of students was recruited through convenience sampling. Convenience sampling is a type of non-probability sampling method in which people are sampled based on easy accessibility for researchers (Scholtz, 2021). The students were arbitrarily approached—either electronically (through instant messenger applications) or in-person at the university—and asked for voluntary participation based on their availability. The succeeding batch of students were recruited through snowball sampling. Snowball sampling is a sampling technique where existing study subjects recruit future subjects from among their acquaintances (Leighton et al., 2021). The overall sample consisted of 19 undergraduate students. Five students were male, wherein the remaining 14 students were female. The sample is a suitable representation of the overall student population at the Faculty of Hospitality and Tourism, Prince of Songkla University where the study took place.

Designing a Self-Learning Gamified Course

To simulate an online course, a self-paced gamified course was designed and developed using the open-source learning

management system, Moodle. The course contained 10 individual lessons about Introduction to Hotel Management. There are graded questions after each lesson. Students' attempts are graded automatically by the learning management system. Students can repeat and retry the questions and the system will compute the average grade based on the count of overall attempts. Conditional access was also implemented in this course, wherein the students cannot move on to the next lesson if they have not completed the current lesson as illustrated in Figure 1.

Additional plugins such as H5P and Level Up! were installed. The plugin H5P in Moodle can be used to build interactive content. In this course, an interactive presentation with auto-play audio, a navigation slide, pop-up questions, and a question summary was constructed using H5P. The second plugin, Level Up!, was added to give experience points, leaderboards and display the current level as the students progress through the course.

The game elements used in this course are points, badges, levels, restricted access, activity completion, and rewards. These game elements are said to be a motivator for Thai undergraduate hospitality management students (Aguilos et al., 2022). The game elements were strategically implemented in the design of this course. The points are presented using the Level Up! plugin and called "XP" or experience points. Students gain points whenever they view a lesson, answer questions at the end of the lesson, post in a discussion, and earn a badge. Students can view their XP on the course's home page and they can see a log of accumulated XP. The points for every lesson get bigger as they move on to the last lesson. For example, students can receive 110 XP in the first lesson, 220 XP for the subsequent second lesson, 330 XP in the third, et cetera. The levels are presented using the Level Up plugin as well and it is in the form of job positions. Starting from a caveman to students, and the last level is a General Manager. The levels show the job progression of an individual in the hotel industry. Each level corresponds to certain points which were automatically set by the plugin's algorithm (Figure 2).

The badges were given to students who got a score of 80% and above for the end-of-lesson activities, and a final score of 90% and above, and participate by posting a discussion at all four forums in the course. Earning a badge is something that is not easily earned to make it more meaningful to students. Earning a badge also adds XP and the latest three badges are seen on the course's home page.

Implementation of the Self-Learning Course

Upon recruiting students to voluntarily participate in the study, an online meeting was held by the lead researcher. The meeting served to introduce the research topic and explain the concept of gamification to students. In addition, the students were given access credentials to the gamified self-learning course. The lead researcher also briefly provided a tour of the learning management system and explained the necessary features. Moreover, an explanation was given on how the participating

students can earn XP points and badges in the online course without disclosing specific course content.

There were six online meeting sessions, wherein two to five students were present per session. The total length of the session was 90 min, wherein 30 min were allotted for introductions and the remaining 60 min to complete the course. Students were not required to complete the course but encouraged to go through each lesson. While the students completed the course, the lead researcher monitored their real-time process through system logs and was available to answer any questions that might arise during the course. After 60 min, students were informed to stop what they were doing and asked to complete a short questionnaire regarding their perception and experience in completing the course. The questionnaire also asked for their willingness to participate in the interviews that were arranged upon completion of the online course.

Data Collection

A series of semi-structured interviews, as well as a focus group discussion, were conducted after the completion of the course to gather rich and meaningful data about the Students' experience with the self-paced course. Questions were about Students' thoughts regarding the game elements found throughout the course, the course design and content of the course, their perceptions of gamification applied in their course, and their attitudes toward online courses in general. All participants were invited to take part in the individual interviews and the students agreed to share their thoughts and experiences with the course. The interviews were recorded and conducted separately at a coffee shop in an informal setting. The individual interviews lasted around 20 min, whereas the guided focus group discussions lasted up to an hour. The question guide for the discussions can be found in Appendix.

Data Analysis

The interviews were audio-recorded with the explicit consent of the participants, and thereafter, transcribed verbatim. The thematic analysis was developed based on good practice (Vaismoradi et al., 2013) following the steps described by Braun and Clarke (2014). First, relevant and important keywords were highlighted in the transcripts. Thereafter, the keywords were converted to codes and bundled into groups based on the underlying themes that they represent (see Figures 3, 4). Next, the bundled codes formed the basis for generating subthemes, which ultimately led to the emergence of four themes (see Table 1) consistent with the steps described by Braun and Clarke (2014).

Ethics

For ethical considerations, written consent was a prerequisite for participation in the study. Before completing the online course as well as before commencing the interview, the students were informed that their responses do not affect their academic performance. Moreover, confidentiality was extended to all participants of the study, and their names are only known to the researchers involved and their identities will not be associated with any reporting of the findings. Lastly,

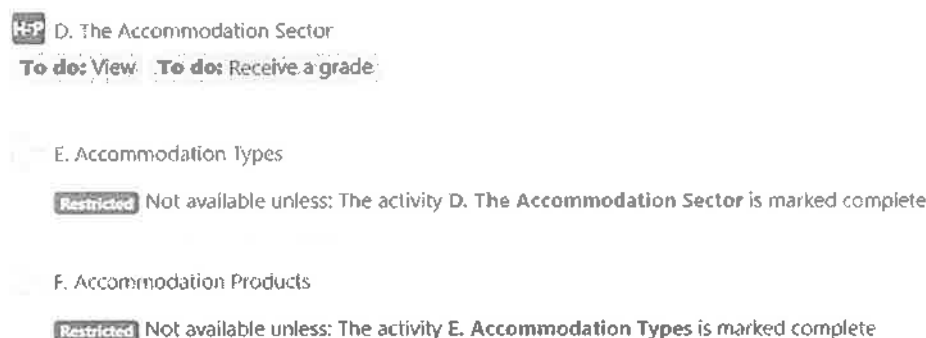


FIGURE 1 | Restricted access to the next lesson until the current lesson has been completed successfully.



FIGURE 2 | Level up information containing the different stages that the participating students can reach in the course.



FIGURE 3 | Excerpt of coded keywords related to negative perceptions of game elements found in the gamified online course.

students received a small monetary reward for participation in the study. Aside from the monetary compensation, students who have completed the course, completing the full 10 lessons and receiving a grade for all lessons, received a gift card as a form of additional reward. In addition to that, a surprise reward was given to those students who reached the highest level (Level 11, General Manager). These rewards were not mentioned at the beginning of the session

so the rewards won't affect the Students' motivation to complete the course.

EMPIRICAL FINDINGS

The following subsections report on the four themes that emerged during the thematic analysis and summarize the

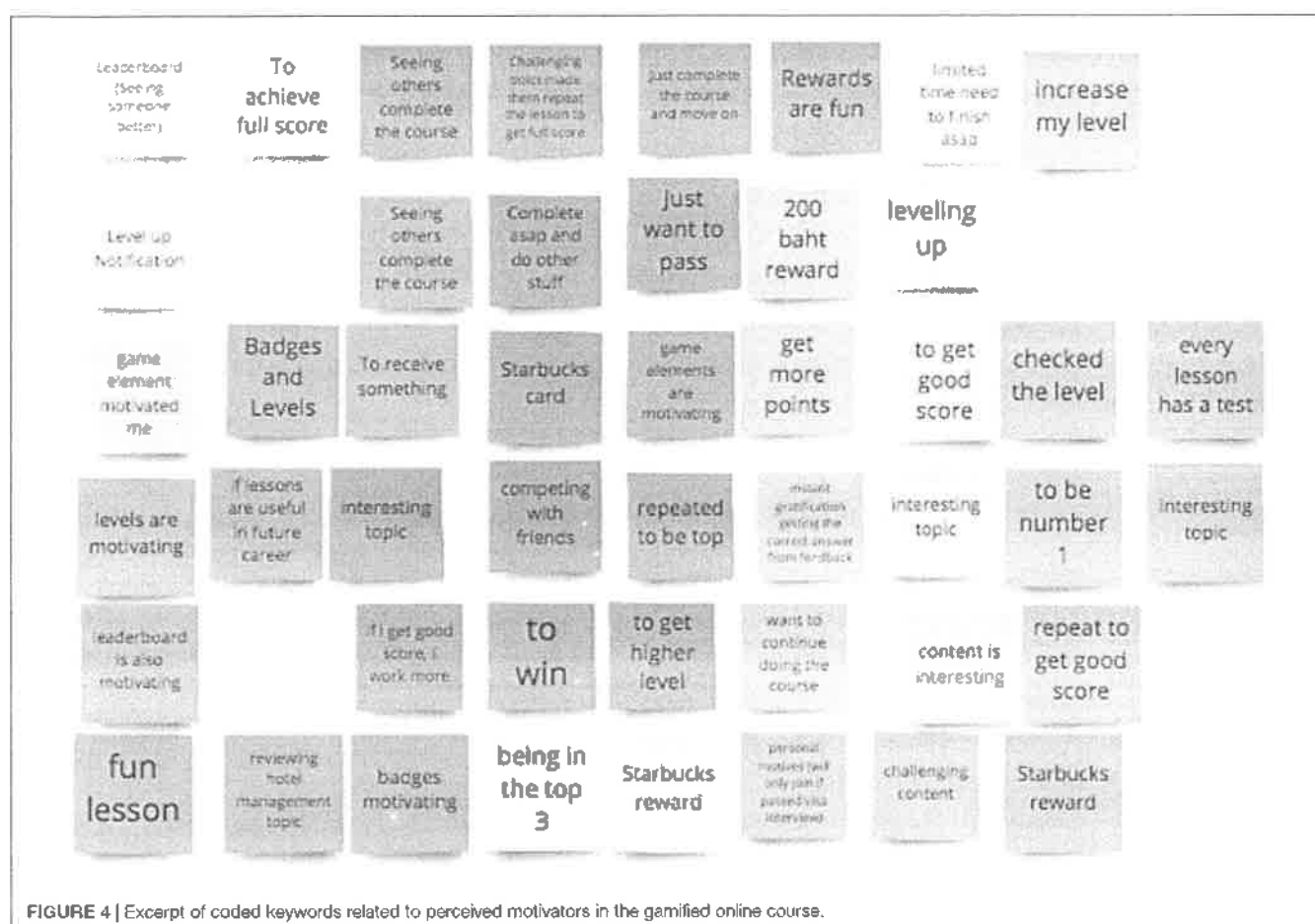


FIGURE 4 | Excerpt of coded keywords related to perceived motivators in the gamified online course.

empirical data. The themes are the result of clustering subthemes in the analysis process (see Figures 3, 4). Namely, these four themes are (1) perceptions of the self-learning course, (2) perceptions of the game elements found in the course, (3) motivations in accomplishing the course, and (4) perceptions of online courses. The study aims to explore how undergraduate students in Thailand perceive gamified learning as part of their tertiary education.

Perceptions of the Self-Learning Course

There were both positive and negative perceptions regarding the self-learning course. Students were very much interested in the topic, Hotel Management. They found it interesting and the content itself was not overwhelming with information. However, some students find the content too easy and not challenging enough. The students also expressed a very positive attitude toward the delivery of each lesson. They mentioned that the lessons were presented well and used a mixture of audio and visual presentation, compared to traditional text-based content. The majority of the respondents also liked the embedded questions used in an H5P lesson where their knowledge was immediately tested.

The chance to unlimitedly repeat the lessons and activities was also viewed positively by the students and they mentioned

that it helped them remember the content since they learn through repetition. Despite the positive feedback on the design and delivery, students mentioned that since they were unfamiliar with the H5P presentation, they did not notice the embedded questions immediately and that they received a 0 mark on their first attempt. Another negative feedback was that the information and notification of leveling up were unnoticeable unless they went back to the home page. Some students also expressed that they like the self-learning course since they can learn at their own pace. The majority of the students conveyed that they learned from other students by reading others' forum posts which gave them a different perspective on the topic.

Perceptions of the Game Elements Found in the Course

The leaderboard received the most remarks concerning the Students' drive to compete and motivation to be in the top three. Some students even expressed their frustrations for not being at the top despite their best efforts or for having someone else better than them. They mentioned that the frustration they felt increased their desire to do better in the following lessons. The XPs and levels received a mixed response, some students enjoyed the level positions and found it interesting to see how

TABLE 1 | Excerpt of the summarized coding based on the empirical data analysis (the list is not exhaustive, but representative of the data analysis process).

Themes	Subthemes	Codes
Perceptions of the self-learning course	Content	Relevant, interesting, sufficient information, easy to understand, some are too wordy, some questions are too easy
	Design and lesson delivery	Able to repeat lessons and activities, immediate testing and evaluation, variation in audio and visual presentation of lessons, variations of testing methods, unfamiliarity with new lesson format (H5P), unnoticeable level indicator and notification
	Learning benefits	Learning at own pace, learning from others, learning by repetition
Perceptions of the game elements found in the self-learning course	Leaderboard	Motivator, challenging, aims to be in the top 3, frustrations for not being top and someone always in the top 1
	Badges	Rewarding, fun collecting, unaware of its XP value and how to get it, not automatically acquired
	XPs and levels	Motivator, fun, encouraged with progress, unaware how to gain XP, unnoticeable
	Activity completion and restricted access	Unable to skip lessons, complicates the navigation
Students' motivations in completing the course	Competition with self and others	Achieving full score on activities, comparing scores with other students, comparing forum posts, seeing other complete the course on time, to be on the top
	Instant gratification	Immediate feedback and evaluation, getting good scores
	Rewards	Compensation and bonus
	Content	Fun lessons, interesting topic
Perceptions of online courses	Boring	Reduce passion to learn, lose interest in studies, unable to focus and learn new things, lots of distractions
	Less interaction	Less interaction with their teachers, less interaction with classmates, impossible to do fruitful group discussion
	Negative attitudes	Uninterested to go back to onsite class, unmotivated to study
	Convenience	Staying at home, self-study, can contact teacher anytime, too relaxed

a receptionist progresses in the industry. Some were motivated to achieve the highest level at the given time, however, only two out of 19 reached the highest level.

On the other hand, some students were unaware of how to gain XPs and unnoticed the leveling up since it can only be seen on the home page. The majority of the respondents mentioned that the sessions lack an adequate explanation of the mechanics of the XPs and levels. The participants expressed that activity completion and restricted access features hindered their desire to skip some lessons and move on to the next. It also made the system navigation a little bit complicated since they cannot just click the next button. Instead, they have to go back to the home page, and then scroll down to the next lesson. The majority of the students claimed that they experienced difficulty in navigating the system.

Students' Motivations in Course

As mentioned previously, students were highly motivated to achieve a full score to be at the top of the leaderboard. This game element was the most recurring motivating factor that was pointed out. Some were motivated to compete with other students, and some used it as a guide to know what score to aim for in the given activity. Seeing other students reach a certain mark, made them want to reach the same or higher mark. Also mentioned previously, the positive response from the relevance and interesting content and design stimulated the Students' curiosity to move on to the next lesson.

Students also mentioned that immediate feedback and evaluation are also motivating factors to continue the course since they brought instant gratification. The monetary compensation

of each participant also contributed to the motivation of students to go through the course. Some believed that if they did not complete the course, they might not get compensated, which was not the case. All students who participated in this study were compensated regardless if they did not complete the course.

Perception of Online Classes

The word boring was a recurring keyword from all respondents. Students expressed extreme dissatisfaction with online classes, saying that they don't have the passion for learning, they lost interest in their studies, and they were unable to focus and learn new things. It was also mentioned that the lack of social interaction with their teachers and peers made it more challenging to learn in online classes. Group works and class discussions were not as fruitful as the classes held in a classroom. Students also developed negative attitudes toward coming back to school. They have developed negative behavior like just turning on the computer and logging in to the online classes then doing other things and ignoring the class. Online classes made them too relaxed in their studies, which they mentioned was bad behavior.

DISCUSSION

It is the aim of the study to explore how undergraduate students perceive gamification as part of their learning experience during their tertiary education. The empirical data analysis revealed a variety of noteworthy findings that require a further interpretation based on the body of literature. Most notably, the design process of a gamified online course is a crucial aspect

to consider and it has to be well thought out. In particular, the gamified elements need to align with the course content and contribute toward achieving the course learning outcomes (Bai et al., 2020). At the same time, the course design needs to incorporate gamified elements that foster the development of knowledge and skills, while keeping the student engaged (Villarroel et al., 2018). Similarly, Landers (2014) stated that instructional design quality in gamified learning is strongly correlated to the learning outcomes of a particular course. Moreover, “for gamification to be successful, it must successfully alter an intermediary learner behavior or learner attitude” (Landers, 2014, p. 14).

Instant gratification refers to the experience of satisfaction or receipt of a reward as soon as a response is made (Nakayama and Wan, 2021). The empirical findings of this study show that gamified learning fulfills the need for instant gratification, which aligns with similar studies (White and Shellenbarger, 2018; Jain and Dutta, 2019). The results of this study revealed that students perceived instant gratification as highly motivating as a result of immediate feedback and evaluation in the gamified course design. Therefore, a well-planned and executed gamified online course has the potential to improve Students' learning outcomes, as well as, enhance their motivation significantly through instant gratification. Although, it should be noted that many of the participants reported that their competitive behavior had a significant effect on completing the activities. Therefore, it could be hypothesized that the effect for competitive students is more significant than for non-competitive students. Furthermore, first-year students had a better perception of the usefulness of gamified learning, since the course content was new to them and hence perceived as more stimulating.

Gamification elements do not automatically motivate or engage students. Students who are very competitive in nature are highly motivated by the game elements. On the other hand, students who are not very competitive tend to overlook the game elements found in the course. However, these students were driven by different motivations, for example, the usefulness and relevance of the content or the immediate evaluation of the activities. A perceived limitation of gamified learning is the inability to engage with students that were unmotivated to complete the online course in the first place. These participants were not actively listening in the introduction of the course, and therefore, were unaware of many game elements in the course. In particular, they had difficulties navigating their way through the learning management system. Serin (2018) concludes that “the implementation of external rewards has no detrimental influence on students. Intrinsic motivation, on the other hand, enables students to work independently and enthusiastically” (p. 191). Therefore, the gamified reward system is likely not to improve the engagement of unmotivated students.

For participants that were recruited in the second stage through snowball sampling, the general understanding of gamified learning was higher than with the first batch. This is likely the result of their interaction with peers who already completed the course in the first phase. Most of these students received the highest number of badges and earned more points,

compared to their peers from the first stage of the study. The effectiveness of game elements also depends on the players' understanding of the mechanics of the games. Therefore, it is suggested to create a persuasive introduction and very informative mechanics of the game elements in a course. Once students understand the mechanics of the game elements, it can trigger their interest and possible engagement with the game elements. There is an agreement amongst scholars that the integration of game elements in class requires more careful consideration of their strengths and weaknesses rather than thinking of gamification as the educational remedy to classroom engagement (Park and Kim, 2021).

Another noteworthy result was based on observed behavior. A few students completed the questions in the course (which would earn them badges and XPs) by specifically looking for clues in the lesson. Other students would report this type of behavior as cheating. It is unavoidable to look for answers when conducting online quizzes, since in real life, whenever we have a question, we would quickly search for the answer online (Harper et al., 2021). The question that derives is if students use gamified learning as a means for instant gratification as a means to an end, but neglect the aspect of developing their knowledge and skills? Similarly, students reported that they do not like monotony. They are more interested in different forms of presentation of lessons, they want something different. Therefore, it ties back into effective course design, otherwise, the students will lose their motivation to participate and simply complete the course as a means to an end. Overall, the study revealed that the effects are greatly dependent on the users using it.

CONCLUSION AND FUTURE WORKS

The study affirms that the gamification of learning has the potential to improve Students' engagement and motivation in an e-learning environment. Structural course design and well-planned implementation are important factors that require a more in-depth analysis of their perceived effect on classroom engagement. In the correct context, gamified learning improves the learning experience for high-performing or competitive students. The study did also reveal that gamified learning did little to no for unmotivated or inattentive students. Therefore, it should not be seen as a holy grail to revolutionize every online classroom. Furthermore, the results of the study are not generalizable to another population and should be considered in the respective geographical context. However, the findings further contribute to the growing body of knowledge on this emerging topic. Certainly, more research is needed about specific game elements that have a higher impact on perceived usefulness than others. Likewise, how to integrate them effectively into an online course, as well as, finding potential avenues to engage unmotivated students through the means of gamified learning.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Research Committee of the Faculty of Hospitality and Tourism, Prince of Songkla University on 23. December 2021 (approval no. FHT64000013). The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

VA and KF contributed to the conception and design of the study, mutually analyzed the data, and wrote the manuscript. VA implemented the empirical data collection. Both authors

contributed to the manuscript revision, read, and approved the submitted version.

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APPENDIX

TABLE A1 | Semi-structured interview questions.

Sequence	Question
No. 1	Did you go through each lesson and read its content or did you skip the lessons and move to the questions?
No. 2	(Students who did not complete the course) what do you think was the reason why you were not able to complete the course?
No. 3	Was the course challenging? Why/why not?
No. 4	Were there any features you liked in the course? If so, what did you like about it?
No. 5	Were there any features you did not like in the course? If so, what did you not like about it?
No. 6	Do you think the game elements made the course enjoyable/fun? What made it enjoyable/not enjoyable?
No. 7	Do you think the game elements made you engaged with the course? What made you engaged/not engaged?
No. 8	Do you think the game elements made the course motivating? What made it motivating/not motivating?
No. 9	Did you repeat some lessons and/or activities? If yes, why?
No. 10	Did you read other Students' comments on the discussion boards? If yes, why?
No. 11	Are you a competitive person?
No. 12	Are you a high-achiever?
No. 13	Do you prefer to self-study or group-study?
No. 14	What are your overall feelings about online learning?
No. 15	Would you like to add anything else about your experience in this course?

To: Members of the Subcommittee for Teaching Evaluation

From: Veronica Aguilos Jamieson

Date: 28 April 2025

Subject: Exemption Justification for IRB Approval: Student Perceptions on Gamification of Language Learning

Dear Members of the Subcommittee for Teaching Evaluation,

I hope this message finds you well. I am writing to seek your kind consideration regarding the assessment of my published research paper, which forms an integral part of my application for assistant professorship. In this letter, I am writing to provide justification for why my research study should be exempted from IRB approval based on Section 3 of the **Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities**¹. Below are the details of the study for which I seek your assessment:

Title: Gamification of Virtual Language Learning: A Case Study with Thai Undergraduate Students

DOI: 10.18178/ijiet.2022.12.10.1726

Year Published: 2022

This study involved a focus group discussion aimed at understanding the factors that motivate university students to study for the TOEIC test, with the broader goal of identifying solutions to low test performance and non-participation.

Recruitment and Voluntary Participation: Participants were recruited from a compulsory ESL course that was part of their degree curriculum. The students selected were those who had not yet met the TOEIC score requirements needed for graduation, making their insights critical to the research objective. Although the facilitator of the focus group was also the ESL course instructor, participation in the study was entirely voluntary. Students were fully informed that their participation or non-participation would have no impact on their grades, academic standing, or course outcomes. No academic incentives or penalties were tied to participation.

Timing and Setting: The focus group session was conducted during the students' regular classroom period to minimize disruption to their academic schedules. The session lasted approximately 45 minutes and focused solely on exploring students' motivations to study for the TOEIC test, particularly in relation to the potential use of gamification strategies.

Informed Consent and Confidentiality: Before the discussion, participants were provided with an informed consent form that clearly outlined the voluntary nature of participation, the confidentiality of their responses, and their right to withdraw at any time without consequences. No personally identifying information was recorded, ensuring that students' privacy and autonomy were fully protected.

Scope of Discussion: The discussion remained strictly within the scope of educational research, focusing on students' motivations, study habits, and perceptions related to TOEIC preparation. No sensitive or invasive topics outside of the study's educational focus were introduced.

¹ <https://necast.nrct.go.th/wp-content/uploads/download-manager-files/ประกาศ-แนวทางปฏิบัติในการดำเนินการวิจัยในมนุษย์-ใช้จริง.pdf>

Data Treatment: No names or personal contact information were recorded or stored. The recorded audio and transcripts from the focus group were securely maintained during the study period and were permanently destroyed after the research was completed and published.

This table below provides an overview of how the research aligns with **Section 3: Research Projects in Behavioral Sciences, Social Sciences, and Humanities that Do Not Require Approval from the Institutional Human Research Ethics Committee of the Guidelines for Conducting Research Involving Humans in Behavioral Sciences, Social Sciences, and Humanities.**² It evaluates the specific criteria outlined in the guidelines, highlighting whether the research meets each criterion through a tick box and providing justifications for alignment. The table confirms that the mentioned research above adheres to ethical standards, which exempts the paper from requiring Institutional Review Board (IRB) approval.

Section 3 Criteria	Research met Criteria	Justification
1. Research projects that do not involve actions on the body, mind, cells, cell components, genetic materials, samples, tissues, or bodily fluids of individuals.	✓	The research focused exclusively on participants' motivation in language learning, without any interventions affecting their body, mind, or health.
2. Research projects involving recorded data in medical records or photographic data of research participants that cannot identify individuals either directly or indirectly.	✓	No recorded data from medical records or photographs were used in this research. All participant information was anonymized, and all data, including interview recordings, were destroyed after research completion.
3. Research projects involving surveys, interviews, or observations of research participants that do not involve or impact the mind, cells, cell components, genetic materials, samples, tissues, health, or behaviors of participants and cannot identify individuals either directly or indirectly.	✓	The focus group discussion is solely on participants' views and input about their studies and its impact on their TOEIC preparation. No sensitive or invasive questions were asked.
4. Research projects related to testing the quality, taste, or consumer acceptance of food, provided that the food does not contain unauthorized colorings, additives not approved by law, or substances exceeding safety levels as defined by the Food and Drug Administration.	✓	The research does not involve food testing.
5. Research projects involving the observation of behaviors in communities or society in general, where data collection does not identify individuals either directly or indirectly.	✓	The research observed participant engagement, interactions, and perceptions, focusing on learning behaviors. Data were anonymized throughout the research process,

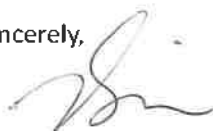
² <https://necast.nrct.go.th/wp-content/uploads/download-manager-files/ประกาศ-แนวทางปฏิบัติในการดำเนินการวิจัยในมนุษย์-ใช้จริง.pdf>

		ensuring that individuals could not be identified directly or indirectly.
6. Research projects related to training, teaching, or evaluation of educational outcomes that do not impact individuals.	✓	The focus group discussion dealt only with TOEIC preparation and language learning, avoiding any sensitive or controversial topics.
7. Other research projects as specified by announcements from the National Research Council of Thailand (NRCT).	✓	This project aligns with the general criteria outlined in Section 3 of the NRCT guidelines.

Given the adherence to ethical guidelines and the measures implemented to protect participant rights and confidentiality, I respectfully request that the committee proceed with the assessment of this paper as part of my application for assistant professorship. I am confident that this research aligns with the high standards expected for academic work.

Thank you for your time and consideration. Should further clarification or documentation be required, I am available to provide additional details.

Sincerely,



Veronica Aguilos Jamieson
Lecturer, Faculty of Hospitality and Tourism
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Academic Contribution Form

A. Title: Gamification of Virtual Language Learning: A Case Study with Thai Undergraduate Students

B. Applicant's status

✓ First author: Verónica Aguilos (Veronica Aguilos Jamieson)¹

☐ Essentially intellectual contributor: Colin Gallagher

☐ Corresponding author: Asst. Prof. Kevin Fuchs, Ph.D.

Type of work

Group 1 ✓ Research

Group 2 Other academic works

☐ Academic work for the industrial sector

☐ Case Study

☐ Academic work for instructional development

☐ Translation

☐ Academic work for public policy development

☐ Patent

☐ Creative work in science and technology

☐ Software

☐ Dictionary, encyclopedia, nomenclature dictionary, and other similar academic work

☐ Creative work in esthetics and arts

☐ Innovation

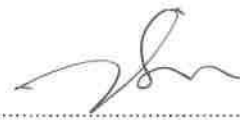
☐ Academic works for social service

Group 3 ☐ Textbook

☐ Book/Monograph

☐ Article

Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

¹ The author, previously published under the maiden name Verónica Aguilos has changed their name to Verónica Aguilos Jamieson due to marriage

Part 1 Contribution details

The applicant must complete all details in this section. (Since there is no requirement to quantify the ratio of academic contributions, details on roles and responsibilities specified will impact the consideration of their academic work.)

Contribution details	Roles and responsibilities
a. Idea and hypothesis	Veronica and Colin: Collaboratively brought the initial idea and hypothesis for the study during a brainstorming session. The discussion focused on understanding why Faculty of Hospitality and Tourism (FHT) students face challenges in passing the TOEIC test, which consequently delays their graduation. Veronica: Initiate the topic of Gamification of language learning and emerged as the central theme of the paper. Developed the hypothesis that gamifying the TOEIC preparation course would motivate students to engage with the material more effectively, leading to improved test outcomes.
b. Research operation, involvement in design, experiment, test, measuring tools, data collection methods, and criteria	Veronica: Conceptualized the paper's rationale, conducting a preliminary literature review, and designing the methodology. She also developed the research plan, schedule, and budget. Lead the proposal and submitted to the faculty's research committee, and the project received a full grant. Acted as the project lead and was the primary communicator with the research committee.
c. Data collection, data analysis, and data transformation	Veronica and Colin: facilitated a focus group discussion to explore students' motivations and barriers in preparing for the TOEIC test. They gathered qualitative data on students' perceptions and preferences, particularly around the potential of gamified learning.
d. Result discussion; display; and comparison with existing conclusions, bodies of knowledge, or theories	Veronica: Transcribed the discussions and conducted thematic analysis to identify key insights that informed the development of the gamified system for learning. She drafted the results and discussion section, integrating insights from the data with existing literature and theories. Added supporting literature and integrated into the discussion.

	Veronica and Colin: Reviewed and discussed the results collaboratively.
e. Involvement in manuscript writing, creative work, innovation, invention, etc.	Veronica: Drafted the manuscript with input from Colin during the writing process, particularly in the discussion and conclusion sections. Colin: Providing input through the writing process. Kevin: Contributed by strengthening the rationale and expanding the literature review. Once the manuscript was complete, Colin proofread the paper and made minor edits. Kevin handled publication preparation, including formatting and referencing.
f. Supportive provision of specimens, study cohorts, logistics, research fund (please specify the source of fund, amount, and year granted), tools, laboratory facilities, and durable articles	Veronica: As project lead, acted as the main communicator with the research committee. Kevin: After publication, coordinated with the faculty and campuses to manage recognition and rewards for the publication.
g. Others	Veronica: Prepared the slides and presented this paper at a virtual conference called 17th Education and Development Conference in March 2022. The contributions of the three authors to the study are as follows: Veronica and Colin each contributed 42.5%, while Kevin contributed 15%.

Signature



(Veronica Aguilos Jamieson)

(First author)

Signature



(Asst. Prof. Kevin Fuchs, Ph.D.)

(Corresponding author)

Part 2 Provide details of the work presentation/display, technology transfer, or knowledge transfer, along with the necessary proof for consideration.

a. Published journal, impact factor, and citation count (database)

The International Journal of Information and Education Technology has an Impact Factor of 0.297 and a CiteScore of 2.8. (Scopus)²

b. Patent, classification, year of patent, type, and country coverage

.....

c. Technical or research reports and intended audience

.....

d. Publications presented as a poster or oral presentation (the type of session such as plenary, symposium, or oral); conference, fair, or exhibition program booklets (venue and country); or books (publisher name and year of publication)

.....

e. Record of research project funding received concerning this work

Faculty of Hospitality and Tourism Full Grant – Contract No. FHT6300001

f. Research receiving a technology transfer, the total licensing fee the researcher received, and proof of the contract

.....

Remark: Please attach any relevant evidence for the items a to f along with this document.

Signature 

(Veronica Aguilos Jamieson)

Applicant

Signature 

(Veronica Aguilos Jamieson)

First author

Signature 

(Asst. Prof. Kevin Fuchs, Ph.D.)

Corresponding author

² <https://www.ijiet.org/>

Gamification of Virtual Language Learning: A Case Study with Thai Undergraduate Students

Veronica Aguilos, Colin Gallagher, and Kevin Fuchs

Abstract—Gamification of learning in higher education has been used as an educational tool to motivate and engage students. Despite its positive impacts demonstrated in the existing body of knowledge, some adversaries are concerned with the decline of learners' intrinsic motivation and becoming independent of extrinsic rewards. This research aims to design a user-centered and meaningful gamification framework for students who are explicitly learning English as a second language to resolve these adversaries. The empirical data for this study was collected through a focus group discussion. It was conducted to obtain students' learning factors that would contribute to user-centered learning. Based on the focus group outcome, a gamification course using a learning management system with embedded gamification features will be best suited for these specific students. The affordances used in this study are rewards, levels, badges, and points. The practical implications of this study are to gain a more in-depth understanding of the students' motivations in language learning, which is crucial in creating a meaningful user-centered game design.

Index Terms—Language learning, gamification, hospitality education, student engagement.

I. INTRODUCTION

Gamification is defined as applying game design principles in non-gaming contexts [1], [2]. It aims to stimulate human motivation and performance [3] and the most common application of this concept is in formal education [4], [5]. The learning outcomes of gamification are mostly positive in terms of increased motivation and engagement; this is according to the systematic literature review of empirical studies on gamification efficacy [4]. However, despite the positive results, there are a few adverse outcomes relating to gamification. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6]. In addition, it can reduce the internal motivation that the user has to take part in the activity, as it replaces internal motivation with external motivation [7].

The success of gamification is defined as applying game design principles in non-gaming contexts [1], [2]. It aims to stimulate human motivation and performance [3] and the most common application of this concept is in formal education [4], [5]. The learning outcomes of gamification are mostly positive in terms of increased motivation and

engagement; this is according to the systematic literature review of empirical studies on gamification efficacy [4]. However, despite the positive results, there are a few adverse outcomes relating to gamification. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6]. In addition, it can reduce the internal motivation that the user has to take part in the activity, as it replaces internal motivation with external motivation [7]. Gamifications' success greatly relies on the context in which it is being implemented and its users [4].

According to Chen *et al.* [8], there are only a few qualitative gamification studies, indicating that current studies in gamification give more attention to data usage and interfering with user behavior, rather than paying enough attention to the actual players' experiences. Thus, qualitative data was collected through a focus group discussion to understand students' learning factors and perceptions in a gamified learning environment. This study aims to design a language learning course based on the students' learning factors to make it user-centric, then choose game elements that would intrinsically motivate students in learning a second language. Moreover, it is the objective of the study to design meaningful conceptual learning gamification to encourage students to learn a second language.

II. LITERATURE REVIEW

A. Gamification of Learning

Gamification is the application of game design principles in non-gaming contexts [1], [2]. It aims to foster human motivation and performance regarding a given activity [3]. According to Hamari *et al.* [4], gamification provides positive effects towards achieving the course learning outcomes more effectively. However, the results are much dependent on the implementation of gamification and the users using it. Gamification of learning was the most common context for implementations [4]. It is not surprising that gamification is applied within education and learning since retaining engagement and motivation among students is a constant and continual challenge. Based on Subhash and Cudney's [9] study, articles related to gamification in education from a systematic search of databases, gamification learning outcomes are mostly positive, for example, in terms of increased motivation and engagement in the learning tasks and enjoyment of such tasks.

Despite the positive learning outcomes, their studies suggested that there are some pitfalls in gamification. Based on research conducted by Domínguez *et al.* [10], despite the students' better scores in practical assignments and an overall

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score, the same set of students performed poorly on written assignments and participated less in activities. The same study also suggested that the cognitive impact of gamification on students was not very significant. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6].

B. Game Elements or Affordances Applied in Learning

Game elements or affordances are the game design principles that are applied in the non-gaming context. According to the systematic review on gamification of learning [9], points, badges, and leaderboards are the most frequently used gamification elements. These elements can be seen in different forms; for example, points can be in the form of a bonus, something earned, or experience points, while badges can be in the form of trophies and rewards. According to the same systematic review, the most significant benefits of gamification in higher education is improved student attitude, engagement, and performance. Engagement, motivation, and enjoyment among students are widely cited as benefits of gamification of learning. Tables A1-A2 (in the Appendix) show an overview of game elements and benefits according to some recent studies on gamification.

According to Hamari *et al.* [4], people interact with gamified systems differently for many different reasons, resulting in variations in the experiences created by these affordances. For example, a study conducted by Jia *et al.* [11] claimed that individual personalities have different perceived preferences on motivational affordances: the results showed that extroverts tended to be motivated by points, levels, and leaderboards, while people with high levels of imagination and openness were less likely to be motivated by avatars. Research undertaken by Xu *et al.* [12] observed that bashful or distracted students were most likely to be engaged in a gamified class compared to active students. In short, a similar outcome is not guaranteed for all students participating in a gamified learning environment.

Based on these studies, gamification of learning has positive outcomes such as increased motivation, engagement, and enjoyment [4], [9]. However, some gamification elements can decrease intrinsic motivation [6], [7], [13] which is the only consistent predictor of academic achievement across different school contexts and cultures [14]. With the lack of motivation and desire to reach their overall potential to learn a second language, learners show minimal effort in developing second language skills. These drawbacks favorably impact second language learning, wherein we want students to learn, practice, and retain second language skills individually.

According to a study conducted by Geelan *et al.* [15], the learning style of individual students also plays a positive role in maintaining continued engagement. To apply gamification in language learning, we focus on the appropriate game elements and affordances according to our target players. We cannot simply use all these elements because previous studies claim effective gamification have different types of users with different characteristics. The effectiveness of gamification varies depending on the players' characteristics [11], [12].

C. Gamification in Learning Management Systems (Moodle)

Many institutions are using LMS to support the quality of education. It is not just a communication channel between teachers and students, but can also be used as a gamification tool. Moodle, for example, is the top open-source tool for Learning Management Systems, according to Pappas [16]. Moodle has been used in a few research studies to implement game elements in the gamification of learning [17], [18]. Game elements such as points, badges, and leaderboards were the most commonly used elements [17].

III. METHODOLOGY

This research project was designed to identify and understand meaningful and effective gamification techniques. The first step is to understand students' learning factors to gain insight into what motivates them and to understand their intrinsic motivators. As suggested in the case study by Geelan *et al.* [15], improving the understanding of learning preferences could maximize the educational benefits of the learning experience through gamification. From a gaming perspective, this process is a way to understand the students or the players. The gamified language learning design, or the game, will depend on the players' learning factors. In this way, the game will be more meaningful to the players.

A. Sample and Setting

A focus group is a small, structured group with selected participants usually led by a moderator. It aims to gather multiple views and attitudes and often requires complex negotiation of the ongoing interaction process among participants [19]. In this study, the focus group will be able to understand students' learning factors and motivation in learning English as a second language. It is a way to gather first-hand information from the participants or potential players. The data was collected from 27 undergraduate students that were enrolled as full-time degree students at the time of sampling. The participants studied for a business major at a large government-run university in southern Thailand. Moreover, the participating students were enrolled in a compulsory ESL course that is part of their degree curriculum.

B. Procedure and Data Collection

The empirical data for this study was collected through one focus group discussion. The discussion was conducted during the students' regular classroom time and lasted approximately 45 minutes. The focus group discussion was guided by open-ended semi-structured questions that aim to investigate the students' experiences in ESL learning. During the focus group, a moderator facilitated the discussion and encouraged involvement from all the participants. Furthermore, a research assistant was present to take notes and record audio. At the end of the discussion, a questionnaire was distributed to gather socio-demographic information about the participants.

C. Data Analysis

After the data collection, the recordings were transcribed

before undertaking the analysis. The core findings for each question were noted and reviewed. The main recurring ideas were critically analyzed to identify themes as presented in the following sections of this paper. The second step was to gather and understand the game design elements or affordances that can be implemented in designing gamification in language learning. This process aimed to classify which affordances would be motivators for our players. During this process, the focus group results were analyzed and some students' learning factors were matched to the affordances. This step was to eliminate unnecessary affordances and choose appropriate affordances that could be used to motivate the students.

After gathering information on the players' learning factors and classifying the appropriate affordances, the formulation of the game took place and all affordances listed as motivators were applied. For this research, a learning management system (LMS), specifically Moodle, created a gamified language learning activity suitable for the players. Moodle offers multiple features convenient to apply gamification in the learning experience. Frequently used affordances such as points, badges, and leaderboards [9] can be applied on Moodle.

IV. RESULTS

Students from this faculty learn the English language mainly from the subject and course offerings from their secondary schools and the university. They mentioned a few hours of self-study and a limited number enrolled in private language schools. Hollywood films, English TV shows, and TED talks were mentioned as their secondary sources of learning English. A few students said that some language learning mobile applications and websites were also used in learning English. Students have been studying the English language for 16-20 years. When they were asked what motivated them to study English, 70% responded by saying to graduate and please their parents. Students from this university are not eligible to graduate if their TOEIC score is below 630 points. 25% of students will settle on getting 630 points to graduate, while the remainder aimed to obtain a higher score higher than 630.

When it comes to language learning methods and techniques, the students mentioned that classroom composition and size could influence their motivation. Students prefer to be in a group with the same level of English skills as their own. A group with varied levels causes embarrassment to some students, either feeling that others look at them as superior or fear of making mistakes. Group and class sizes also matters; students prefer a relatively smaller group, around 5-20 students per class when it comes to language learning. They prefer to obtain more constructive and hands-on feedback from their teachers. Students mentioned that negative feedback is only acceptable if it is given from someone with authority and expertise and is delivered in a non-embarrassing way.

Students had consensus answers regarding recognizing their English assessment accomplishments or group competition. While being recognized can boost motivation, they mentioned that announcing TOEIC accomplishments on

social media, such as Facebook, is not encouraging but rather embarrassing. In addition, individual competitive behavior, such as getting a reward for getting the highest mark, was not perceived as an encouraging or motivating factor. 81% of the students say that they do not want to compete with others and 96% say they would rather compete with their old selves, aiming for self-improvement and checking their learning progress.

When it came to the effectiveness of teaching methods and classroom tools, interactive media or whiteboards such as SMART Technologies were the most effective, as well as real-life simulation or role-playing. 78% mentioned that interactive classrooms with supplementary mobile applications or software were effective means by which to study and, at the same time, helped them engage with, attend, and participate in class. 93% said role-playing or real-life simulations allowed them to practice their English skills. They believed that practical application was better than having academic tasks such as grammar lessons, seat works, and quizzes. Other means such as mobile learning apps, quizzes on LMS (56%), and video tutorials (70%) were also considered useful learning tools. 93% of students mentioned fun classroom games like Kahoot!, a game-based learning platform; they said that it is engaging and exciting while they are playing. Still, it did not have a long-term effect on learning.

TABLE 1: AFFORDANCES THAT CAN BE A MOTIVATOR OR NOT A MOTIVATOR FOR THE PLAYERS

Affordances	Motivator	Not a Motivator
Earning Points	Points that can be converted to grades	Points that cannot be converted to anything
Badges/Medals	Something to show off to their parents	If it is announced in any form of social media
Levels	For self-improvement	Public announcement or leaderboard
Rewards	Money and grades (to graduate)	-
Competition	Competition with themselves	Competition against others

The second step is to gather and understand the game design elements or affordances that can be implemented in designing gamification in learning and education. Game elements are used to increase the learners' motivation. Table 1 shows the summary of the affordances that can be a motivator or a demotivator for the players.

Referring to the information gathered from the focus group, the following game design elements will be used in this research: rewards, levels, badges, and points. Competition with oneself can be incorporated with the level and badge affordances. These game design elements were indirectly included in the focus group discussion and were concluded as motivators for our respondents, Thai undergraduate hospitality management students.

V. DISCUSSION

Before applying the affordances in a language learning activity in Moodle, adequate planning and development should be taken into consideration. The badge is the most common game element used in Moodle [17]. To incorporate points and levels, a plugin is needed to showcase these

affordances. The Level Up! plugin for Moodle can present students with their current levels based on points they earned, praise their progress once they move on to the next level and unlock content that requires a certain level to access it, and other customizations to make it more engaging and exciting [20].

The Level up! plugin will play a big part in designing a gamified Moodle course. One of its features is to automatically attribute points to students for their actions. It can also report the students' levels to the students and the teacher. As part of the planning and development, the teacher will set certain points for specific actions in the system and achieve the next levels.

Activities set up in Moodle can be in the form of a lesson, forum, or quiz. Teachers can allocate points for participation in lessons, answering and contributing to forums, and achieving specific scores in quizzes. Points can also be rewarded for simple tasks such as reading in advance, asking questions, or referencing an external resource. This way, students can be more engaged in lessons and more motivated to learn, knowing their simple actions can be rewarded. Using points as a game element can increase the engagement and motivation of students in comparison to traditional methods [2], [12], [17], [21]-[25].

For the levels, the teacher can set up the first few levels to be easily achieved; thus, students will be engaged and motivated upon seeing their levels improve. The points needed for leveling up should gradually increase to challenge students to perform better and encourage them to undertake more tasks to earn points. Previous studies on gamification and game-based learning mentioned that this game element could motivate students [2], improve students' performance [26], and increase engagement [21], [27].

Badges should be meaningful to players, something that is not earned too quickly [28]. To do so, badges should be designed to be awarded after the accomplishment of certain cumulative tasks, such as completing a lesson and receiving a high score for the lessons quiz, or it can be about perseverance by taking practice tests or lessons every day for 30 consecutive days or more. The awarding of badges can be set up automatically by the system by establishing certain criteria to be accomplished within a given timeframe. It can also be granted by the teacher if necessary. Badges can also have an equivalent point to be earned at the same time as the badge is acquired so that students can level up as well. Badges can motivate, engage, and improve students' attitudes and performances in learning [17], [22], [24]-[26], [29]-[31].

Rewards can boost engagement [21], improve learning outcomes [32], and increase motivation, confidence, and academic effort [31]. When it comes to rewards, teachers can reward students with badges for particular excellence achieved throughout the course. This can be in the form of badges or points. Other means of rewards can be in the form of virtual money, which can be used to unlock specific tasks or in exchange for skipping a day for review. The rewards given in this game design should not be too attractive for the students, as this can result in them depending on external rewards [13], [33]. However, all these are extrinsic rewards

that may motivate students in a short period.

This gamified language learning course's overall design was based on the students' input from the focus group. The plan is to boost self-development and let students see their progress over time. It encourages students to compete with their old selves and challenge themselves to perform better. Based on the previous gamification of learning research [34] studies, each affordance and its implementation mentioned were all aiming toward a more meaningful learning gamification design for students to be more engaged and intrinsically motivated to learn a second language. Similarly, a study conducted by Fuchs [35] revealed that gamification had a positive impact on the students learning progress. However, if the game elements are not carefully planned and executed, it will negatively impact the students' motivation throughout the entire course [35], [36].

VI. CONCLUSION

Gamification can be a powerful tool to enrich the students' learning experience and foster their learning process. However, the study also revealed that gamification approaches have the potential to decrease intrinsic motivation without considering the players' needs and goals. Therefore, if not carefully planned and implemented, it will lead to ineffective learning gamification. The combination of user-centered game design elements into a non-game context can lead to meaningful gamification. User-centered meaningful gamification will result in longer-term and deeper engagement between users, non-game activities, and supporting organizations. This study has given much consideration to the highlighted shortcomings of earlier studies in reducing the inefficient gamification elements. Understanding the students' motivations in language learning was crucial to creating a meaningful user-centered game design. It is a necessary step to assess the game elements that are used in gamified learning through the learners' experience. These elements include points, badges, and leaderboard activities. When it comes to designing gamified learning, the main objective in applying the game elements is to boost self-improvement and progression in learning a language, which is considered an intrinsic motivation for students.

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DISCLAIMER

Any opinions, recommendations, and conclusions expressed in this paper are solely the intellectual result of the author and do not reflect the viewpoint of the Faculty or University.

APPENDIX

A. Supplementary Material

TABLE A1: GAME ELEMENTS (POINTS AND BADGES) AND THEIR PERCEIVED BENEFITS

Affordances	Benefits
Points	Motivation, interest, and knowledge [2]
	Engagement and enjoyment [12]
	Motivate to participate and engage in learning [17]
	Engagement and retention [21]
	Engagement, more effort, and higher quality work [22]
	Motivation, engagement, enjoyment, and perceived learning [23]
	Performance, engagement, and attendance [24]
	Motivation and performance [25]
	Improved student performance [26]
	Improved attitude and learning outcomes [29]
Badges	Improved student performance [30]
	Increased competition [33]
	Psychological satisfaction [3]
	Motivate to participate and engage in learning [17]
	Engagement, more effort, and higher quality work [22]
	Performance, engagement, and attendance [24]
	Motivation and performance [25]
	Improved student performance [26]
	Improved attitude and learning outcomes [29]
	Improved student performance [30]
	Engagement, performance, confidence, motivation, and academic effort [31]

TABLE A2: GAME ELEMENTS (LEADERBOARD, LEVELS, REWARDS, FEEDBACK, TEAMWORK AND ROLE PLAY) AND THEIR PERCEIVED BENEFITS

Leaderboard	Psychological satisfaction [3]
	Motivate to participate and engage in learning [17]
	Engagement and retention [21]
	Engagement, more effort, and higher quality work [22]
	Performance, engagement, and attendance [24]
	Improved attitude and learning outcomes [29]
	Improved student performance [30]
	Engagement, performance, confidence, motivation, and academic effort [31]
	Enjoyment, motivation, engagement, and perceived learning [34]
Levels	Motivation, interest, and knowledge [2]
	Engagement and retention [21]
	Engagement [27]
Rewards	Engagement and retention [21]
	Engagement, performance, confidence, motivation, and academic effort [31]
	Improved learning outcomes [32]
Feedback	Motivation, engagement, enjoyment, and perceived learning [23]
	Motivation, confidence, engagement, and attention [36]
Teamwork	Motivation, interest, and knowledge [2]
	Psychological satisfaction [3]
	Improved attitude and learning outcomes [29]
Role Play	Motivation, engagement, enjoyment, and perceived learning [23]

CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

The authors confirm sole responsibility for the following: study conception and design, data collection, analysis and

interpretation of results, and manuscript preparation. All authors contributed equally to this work.

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