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WELCOME SPEECH FROM THE CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

بسم الله الرحمن الرحيم السلام

عليكم ورحمة الله وبركاته

Greetings to all,

It is with great pleasure that I welcome you to the 17th RISM International Surveying Conference for Undergraduates (ISCU 2025), themed “*Embracing Construction Revolution 4.0: Transforming Malaysia’s Built Environment.*” On behalf of the Royal Institution of Surveyors Malaysia (RISM), I also wish to express our sincere appreciation to Universiti Teknologi MARA (UiTM), Perak Campus, for graciously hosting this significant event.

As we navigate the era of the Fourth Industrial Revolution (IR4.0)—or in our context, Construction Revolution 4.0 (CR4.0)—we are witnessing transformative advancements across the global construction sector. Technologies such as Building Information Modelling (BIM), the Internet of Things (IoT), artificial intelligence (AI), robotics, big data analytics, and cloud computing are redefining the way we build, manage, and interact with our built environment. For Malaysia, embracing CR4.0 is a strategic imperative to achieve our socio-economic and environmental goals.

This conference serves as a vital platform to unite surveying undergraduates from various disciplines, fostering critical dialogue on industry challenges, enhancing professional networking, and preparing a new generation of talent for the rapidly evolving construction landscape. It is also an opportunity for employers to engage with and inspire our future professionals.

I would like to extend my heartfelt thanks to all industry speakers, paper presenters, judges, and participants for their time, contributions, and support in making ISCU 2025 a success. I also commend the organising committee for curating a meaningful and dynamic conference experience.

May the knowledge gained, connections formed, and ideas exchanged during this event inspire all participants to lead and innovate in their future endeavours.

Wishing everyone a productive and memorable conference.

Prof. Ts Sr Dr. Adi Irfan Bin Che Ani'

Chairman, Universities' Partnering Committee

RISM Session 2024/2025

May 2025

WELCOME SPEECH FROM CO-CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

Bismillahirrahmanirrahim.

السلام عليكم ورحمة الله وبركاته and greetings to all.

It is my great pleasure to welcome everyone to the 17th International Surveyor Conference for Undergraduates (ISCU 2025), proudly hosted by Universiti Teknologi MARA (UiTM) Perak Branch in collaboration with the Royal Institution of Surveyors Malaysia (RISM). This event is a meaningful platform for students in the built environment to share ideas, showcase innovations, and build professional networks. We are honoured by your presence and enthusiastic participation, with 135 accepted papers and 78 poster presentations this year.

UiTM Perak, home to the College of Built Environment, has long been a hub for academic excellence in architecture, planning, and surveying. Our commitment remains strong in nurturing competent graduates who meet industry demands and contribute to nation-building.

While you're here, we invite you to experience the heritage and culture of Perak Tengah from the architectural richness of Rumah Kutai to the historical towns of Pasir Salak, Bota, and Kampung Gajah.

To all presenters and winners, congratulations on your achievements. Let your work today be a catalyst for future success and academic growth. We hope this conference will inspire you to explore new ideas, foster collaboration, and make lasting memories.

My deepest thanks to the Royal Institution of Surveyors Malaysia (RISM) and the organising committee for making this event a success.

We hope your experience here will be rewarding and unforgettable.

Thank you. Selamat datang dan selamat berjaya.

Associates Professor Dr. Nur Hisham Ibrahim, *PMP*

Co-Chairman, Universities' Partnering Committee

RISM Session 2024/2025

May 2025

WELCOME SPEECH FROM THE PROJECT DIRECTOR

RISM 17th International Surveying Conference for Undergraduates 2025

Alhamdulillah, all praise to Allah S.W.T. for His guidance and blessings in making the RISM 17th International Surveying Conference for Undergraduates (ISCU) 2025 a reality.

It is with great honour and gratitude that I welcome all participants, guests, academicians, and industry professionals to this prestigious event, proudly organized under the Royal Institution of Surveyors Malaysia (RISM). This 17th edition of ISCU stands as a proud testament to our collective dedication toward academic excellence, professional collaboration, and youth empowerment in the field of surveying.

I extend my heartfelt appreciation to RISM for its unwavering support, to the hardworking ISCU 2025 Organising Committee, and to all 16 partnering universities across Malaysia for their commitment and contributions. Your efforts have shaped this conference into a dynamic platform for knowledge exchange, innovation, and professional growth.

To the academicians and practitioners present, your insights are invaluable in bridging the gap between academic theory and real-world practice. To our undergraduate participants, your passion, curiosity, and commitment are the very foundation of our future. May this conference not only deepen your academic journey but also ignite a spirit of leadership, integrity, and sustainable thinking.

Let this gathering serve as more than an academic milestone. May it foster lifelong networks, inspire transformative ideas, and chart new directions in our shared professional journey.

Wishing everyone a rewarding and inspiring conference experience.

Sr Dr. Nurul Fadzila Zahari

Project Director

RISM 17th ISCU 2025

GAME-BASED LEARNING IN CONSTRUCTION LAW FOR THE BUILT ENVIRONMENT

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ABSTRACT

Game-based learning has become a practical educational approach, enhancing student engagement and knowledge retention through interactive experiences. In construction legal education, where understanding complex legal frameworks is essential, traditional lecture-based methods often lack interactivity and real-world application. Gamification, incorporating challenges, rewards, and simulations, offers a solution by providing a more engaging and practical learning environment. This study adopts a quantitative research approach to explore the integration of game-based learning in construction legal education. The objectives are to identify suitable game types for construction-based learning and determine which aspects of legal studies can be effectively adapted for gamification. A pilot study was conducted through a Focus Group Discussion (FGD) with legal lecturers and industry practitioners to gain insights into the key legal concepts relevant to the built environment. The primary data collection involved surveys and structured assessments with students and educators in construction legal studies, followed by statistical analysis to evaluate the effectiveness of different game-based learning methods. The findings of this study are expected to demonstrate how gamification can enhance students' understanding of legal concepts through interactive simulations, contract negotiations, and dispute resolution exercises. By integrating digital learning strategies, this research aims to modernise construction legal education, improve student engagement, and bridge the gap between theoretical knowledge and practical application. The significance of this study lies in its potential to transform conventional teaching methods, increase knowledge retention, and better prepare students for real-world legal challenges in the construction industry.

Keywords: Game-Based Learning, Gamification, Construction Law, Legal Education, Focus Group Discussion, Interactive Learning

I. INTRODUCTION

Game-based learning (GBL) is gaining popularity as an effective educational approach to enhance student engagement and knowledge retention. In the context of construction legal education, traditional lecture-based methods often lack interactivity and real-world application, making gamification a valuable solution. Evidently, in studies by Maulida et al. (2022) and Eleny and Ahmed (2024), GBL supports cognitive development and fosters transferable skills such as decision-making, problem-solving and resource management, which are critical in construction law education.

Recent advancements in the construction industry, which align with the Fourth Industrial Revolution, have created a pressing need for educational methods that align with industry demands while equipping students with technical expertise and transferable skills. Elenany and Ahmed (2023) classify GBL tools into three categories: tabletop games, digital games, and computer-assisted games, each offering unique benefits for enhancing construction management education. These tools support acquiring technical skills like resource allocation and project scheduling and cultivate soft skills such as communication, problem-solving, and decision-making. The versatility of GBL in addressing diverse educational objectives makes it a valuable asset for construction law education (Akour, Alsgahier, & Aldiabat, 2020).

I. PROBLEM STATEMENT

In legal education, gamification has gained traction to make abstract legal concepts more accessible and engaging by incorporating elements such as simulations, challenges, and reward systems. This provides a dynamic platform to bridge the theoretical instruction and practical experience gap. For instance, Yasmina Riega-Virú et al. (2025) explore the impact of gamification on teaching General Criminal Law to university students. The researchers used educational games such as Legal-Historical Domino and Conceptual Cards to significantly improve students' knowledge acquisition and engagement levels. The quasi-experimental design substantially enhanced students' understanding of legal principles. This study highlights the effectiveness of gamification in enhancing academic performance and motivation within legal education, offering valuable insights for modernising traditional teaching methods to meet 21st-century challenges effectively. Despite its potential, the adoption of GBL in construction law remains limited compared to other disciplines. Ilbeigi et al. (2023) identify several barriers, including a lack of systematic game design and evaluation frameworks.

While gamification has shown measurable benefits in general legal education, its adoption in specialised fields such as construction law remains limited. Various game types have been applied to enhance engagement and contextual understanding, including scenario-based simulations (Bouki et al., 2014), 3D legal role-play games (Economou et al., 2014), multiplayer metaphor-based games (Sanchez & Emin-Martinez, 2014), narrative-driven quiz games (Gravelsina & Daniela, 2024), and card-based reasoning tools like Ratio! (Yuratich, 2021). Each format targets specific legal skills such as interpreting statutes, understanding procedural steps, or constructing legal arguments through interactive and reflective gameplay. While these tools have demonstrated improvements in student motivation, comprehension, and knowledge retention, they are primarily used in general law, copyright law, or corporate compliance. Structured adaptation to construction law remains significantly underexplored, particularly for teaching standard forms of contract, claims processes, and dispute resolution.

Current pedagogical approaches are predominantly lecture-driven, focusing on rote memorisation and text-based legal analysis. While these methods establish a foundational understanding of legal frameworks, they often fail to engage students meaningfully or promote the development of practical competencies required in real-world construction scenarios. This disconnect is particularly critical in a field requiring a nuanced grasp of legal doctrines, contract administration, and dispute resolution processes. Maulida et al. (2022) argue that the absence of interactive, experiential elements in legal education reduces student motivation and lower retention rates. Furthermore, the widening gap between industry expectations and graduate competencies has raised concerns about the adequacy of current teaching practices in equipping students with relevant skills. Challenges such as a lack of structured game design frameworks, limited faculty training, and minimal institutional support have hindered the widespread adoption of GBL in construction-related legal instruction (Elenany & Ahmed, 2024). Although other disciplines have successfully implemented gamified strategies, construction law's specialised and technical nature demands a tailored approach that is yet to be fully realised. As such, there is a pressing need for research-driven solutions that integrate gamification into construction legal education in a pedagogically sound, scalable, and contextually relevant manner.



Figure 1.0 Bridging GBL and Construction Law

Given these challenges, the present study examines how gamification can be effectively introduced into construction law instruction to enhance engagement and promote practical legal competency. The primary focus lies in identifying appropriate game formats compatible with construction-based legal scenarios and determining which aspects of legal content are most adaptable to interactive learning environments. The expected outcome is a gamification framework that supports the shift from theoretical memorisation to applied learning, enabling students to better internalise legal principles through experiential engagement. Through this initiative, the study seeks to contribute toward the modernisation of construction law education and support the development of competent graduates equipped to meet the legal complexities of the construction industry.

II. RESEARCH OBJECTIVES

The objectives of this study are as follows:

1. To identify the most appropriate types of games for facilitating game-based learning for construction of legal studies.
2. To determine the components of construction legal studies most suitable for adaptation to game-based learning approaches.

II. LITERATURE REVIEW

Game-based learning has emerged as a pragmatic educational strategy, amplifying student involvement and knowledge retention by immersing learners in interactive experiences. Within the realm of construction, legal education as a domain that necessitates comprehending intricate legal frameworks from the traditional lecture-centric pedagogical approaches often fall short due to their lack of interactivity and practical application (Maulida et al., 2022). To remedy this gap, gamification techniques incorporating challenges, rewards, and simulations present an attractive solution by fostering a more engaging and realistic academic atmosphere for students (Elenany & Ahmed, 2024).

Implementing game-based learning methods requires deliberate selection of suitable game types tailored to construction-legal domains while efficaciously integrating legal studies concepts into gamified activities. Maulida et al. (2022) utilised a quantitative research approach to investigate the integration of game-based learning in construction legal education. Their study focused on identifying appropriate game types for construction-based learning and determining which aspects of legal studies could be effectively adapted for gamification. Through a pilot study conducted via Focus Group Discussions (FGD) with legal lecturers and industry practitioners, key legal concepts pertinent to the built environment were elucidated to inform the subsequent implementation of game-based learning strategies.

Elenany & Ahmed (2024) underscored the imperative need to adapt pedagogical approaches to cater to the construction industry's digital transformation. Recognising the widening disparity between industry requisites and incumbent graduate proficiencies, they advocate for leveraging game-based learning techniques to augment technical and transferable skills among digitally native students who often confront challenges with conventional teaching methodologies. By developing a digital simulation game named '*Always Under Stress*' utilising the Godot game engine, Elenany & Ahmed (2024) elucidated the potential of educational games in cultivating resource management competencies within the context of construction projects.

Furthermore, Tavares (2019) emphasised the burgeoning trend of academic gamification as an innovative substitute for conventional instructional methods, positing that embedding gaming elements in teaching materials can catalyse student motivation and engagement. Anchored in the existing literature by Alves and McGonigal, Tavares' discourse accentuates the pivotal role of technological acumen among contemporary educators in enhancing students' learning experiences vis-à-vis interactive gamified activities. Tavares (2019) elucidates how this novel approach can foster greater student involvement and knowledge assimilation within evolving educational landscapes by delineating teaching methodologies and applications of gamification in legal education.

Table 1.0 Game-Based Learning In Construction Law - Literature Matrix

Authors	Focus Area	Game Type	Strengths	Limitations
Bouki et al. (2014)	Gamified legal scenario learning	Scenario-based app	Accessibility, student engagement	Lacks construction law specificity
Economou et al. (2014)	Simulation-based legal role-play	3D role-play simulation	Customisable, cost-effective	Requires initial tech setup
Sanchez & Emin-Martinez (2014)	Collaborative legal rule learning	Multiplayer metaphor-based	Empirical model, epistemic interaction	Limited to copyright laws
Yuratich (2021)	Common law reasoning game	Card-based reasoning	Deep understanding of legal reasoning	Not construction-specific

Kuhmonen et al. (2019)	Legal board game co-creation	Educational board game	Soft skills + content integration	Gaming law focus only
Gravelsina & Daniela (2024)	Game-based legal exams	Narrative quiz game	Low anxiety, high visualisation	Single cohort tested
Werneck & Chang (2009)	Corporate GBL implementation challenges	Prototype game system	Industry relevance, researcher insight	High resistance from companies
Seah (2020)	Game quizzes in law school	Online quiz (Kahoot)	Active recall, adaptive feedback	Limited to adult learners
Salmasi & Gillam (2009)	Ethics in virtual gambling systems	Virtual casino environment	Ethical modeling and oversight	Not tailored for construction law
Udroiu (2019)	GDPR training via games	Scenario-based module	GDPR awareness and training	Generic legal compliance only
Emelianova (2018)	Legal communication in a multicultural setting	Game-aided vocabulary training	Cross-cultural communicative skills	Language focus, not law content
Monjelat et al. (2017)	Peer scaffolding in GBL	Commercial video game	Enhanced peer learning	Limited domain focus
Sanchez (2017)	Collaboration & competition in GBL	Cooperative/competitive hybrid	Holistic GBL strategy	Needs broader legal application
Fischer et al. (2024)	Simulation games for legal regulation learning	Business simulation game	Interactive policy compliance training	Focus on climate, not construction

In summary, the growing body of literature strongly supports the value of GBL in promoting active learning, enhancing cognitive outcomes, and developing practical skills within legal and technical education. However, a notable gap exists in applying GBL specifically to construction law education. The lack of domain-specific games addressing legal procedures, contract administration, and dispute resolution highlights the need for further research and development. Future directions should explore co-designing game scenarios with industry practitioners, developing digital role-play platforms, and incorporating learning analytics to track student progress. These efforts can play a vital role in bridging the gap between theoretical knowledge and practical application in construction law instruction.

III. METHODOLOGY

This study adopted a mixed-methods approach, beginning with a qualitative pilot study through Focus Group Discussions (FGDs), followed by a quantitative phase involving structured surveys and assessments. This sequential design aimed to explore key legal concepts in the built environment, identify the most suitable elements for gamification, and evaluate the effectiveness of various game-based learning (GBL) interventions in the context of construction law education.



Figure 1.0 Research Design

Phase 1: Focus Group Discussion (FGD)

An exploratory FGD was conducted with a purposive sample of legal academics and industry professionals with experience in construction law and contractual practice. The objective was to identify essential legal concepts and practical scenarios frequently encountered in the built environment. The FGD facilitated expert input on how legal topics could be realistically translated into game-based learning modules. Audio recordings of the session were transcribed and subjected to thematic analysis to identify recurring themes and learning priorities.

Phase 2: Survey

The second phase involved the administration of structured questionnaires and assessments to two primary target groups: undergraduate students enrolled in construction legal studies and lecturers who teach law-related courses within the built environment programs. The survey included closed-ended and Likert-scale items to measure attitudes towards traditional and game-based learning methods, perceived effectiveness, motivation, engagement, and knowledge retention.

Sampling and Participants

A total of 250 participants were involved in the quantitative phase of the study, including 240 students and 10 lecturers from higher education institutions offering Quantity Surveying and Construction Management programs. A stratified sampling method was applied to ensure a balanced representation across various academic levels and teaching experiences.

Data Analysis

Qualitative data from the FGD were analysed using thematic analysis to extract key themes that informed the game design. Quantitative data from surveys and structured assessments were processed using descriptive and inferential statistical methods. Descriptive statistics such as mean scores and standard deviations provided an overview of participant responses. Inferential analyses, including paired t-tests and ANOVA, were used to determine the statistical significance of knowledge gains and variations in perception between traditional and game-based learning approaches.

IV. EXPECTED OUTCOMES

This study seeks to provide significant insights into implementing game-based learning (GBL) in legal education, specifically concerning construction law. Incorporating GBL is expected to improve student engagement, motivation, and retention of legal concepts relative to traditional lecture-based methods. By integrating interactive simulations and authentic legal scenarios into the educational framework, students are expected to exhibit enhanced comprehension and application of fundamental legal principles, including contract administration, claims management, statutory interpretation, and dispute resolution. Educators may enhance instructional efficacy and boost student engagement using experiential teaching strategies. Moreover, the study aims to reconcile the disparity between theoretical legal knowledge and its practical implementation, particularly in specialised domains such as construction law and regulatory compliance. The results are anticipated to guide the creation of a systematic pedagogical framework that may be tailored to diverse legal education environments while remaining pertinent to construction-specific learning goals. The research aims to transform student perceptions of legal education, enhancing its accessibility, engagement, and relevance to contemporary legal practice within the construction sector.

V. CONCLUSIONS AND RECOMMENDATIONS

This study shows that game-based learning (GBL) can help improve how construction law is taught. Traditional teaching methods, like lectures, often do not help students fully understand or apply legal concepts in real-life situations. Using games—such as simulations, role-playing contract discussions, and solving legal problems—can make learning more enjoyable and easier to remember. The pilot study with lecturers, industry experts, and students suggests that GBL helps students become more involved and better understand legal ideas. It is recommended that educators create games that match fundamental construction law topics and use digital tools to support this kind of learning. Future research should look at how GBL affects students over a longer time and work with industry partners to ensure the content is helpful for real jobs.

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