E-BOOK OF EXTENDED ABSTRACT

THE 14TH INTERNATIONAL INVENTION, INNOVATION & DESIGN COMPETITION 2025

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PLAYFUL PEDAGOGIES IN URBAN DESIGN: ENHANCING LEARNING THROUGH GAME-BASED GROUP ACTIVITIES

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ABSTRACT

Urban design education is traditionally shaped by studio-based and lecture-driven formats. However, these methods often struggle to engage students, particularly in fostering creativity, collaboration, and critical thinking. The integration of incorporating game-design approaches in education has reflected in a significant boom in the marketing landscape. Based on the Theory of Gamified Learning, this paper presents a pedagogical innovation that incorporates game-based group activities into an undergraduate urban design course to address student disengagement and passive learning. This study investigates how immersion influences students' competence, autonomy and relatedness among learners that positively affects their engagement during class and outcomes. The intervention involved structured activities such as Urban Design Crossword, Planning Poker, and UD Dice Game, designed to align with weekly learning outcomes and promote active participation among students. Conducted over a 14-week semester, the study employed questionnaire survey on 27 students and classroom observations. Findings of this study indicate that game-based learning enhanced student motivation, peer interaction, and engagement during learning session. Students appeared to be more motivated and improved self-confidence during learning sessions. Approximately 89% of students reported increased enjoyment, and qualitative reflections highlighted improvements in teamwork and communication. Additionally, the students also demonstrated stronger critical thinking and an improved ability to navigate complex urban design challenges collaboratively. These results support broader educational theories advocating for active learning and align with contemporary shifts in design pedagogy toward more inclusive, student-centered approaches. This study intends to provide useful insight for academicians and policymakers seeking to improve teaching performance by applying gamification in the public universities.

***Keyword**:* urban design education, teaching innovation, gamification, active learning, student engagement, group activities

1. INTRODUCTION

The field of urban design, with its inherently collaborative, multidisciplinary, and problem-solving nature, offers fertile ground for pedagogical innovation. As higher education institutions shift toward student-centered learning approaches, there is growing recognition of the need to move beyond traditional lecture-based delivery methods. This extended abstract presents a reflective exploration of the use of game-based group activities as a pedagogical tool to enhance student engagement and interactivity in urban design education. The teaching innovation described here was implemented in an undergraduate urban design studio course, where the primary objective was to transform the classroom environment into a dynamic and participatory learning space. Inspired by principles of active learning and gamification principles (Anderson & Dill, 2000); (Kapp, 2012), the approach involved the integration of structured group games such as urban design charrettes, design battles, and scenario-building competitions. Game Based-Learning (GBL) refers to *"the pedagogical approach of utilizing*

games in education"(Anastasiadis & et.al, 2018). It is a teaching methodology that primarily uses games, whether they be digital or physical, to get students interested in what they are studying. These activities encourage creativity, critical thinking, teamwork, and visual communication by involving students in solving real urban problems (Gee, 2003); (Anastasiadis & et.al, 2018). Gamification is defined as the *"use of game design elements in non-game contexts"*. Gamification incorporates game elements such as leaderboards, badges, and points into learning environments to boost motivation and participation (Deterding et al., 2011); (Anderson & Dill, 2000). Both methods improve student engagement and help develop skills essential for urban design professionals. These activities were framed around real-world urban challenges, prompting students to work collaboratively in timed, goal-oriented settings. By integrating game design into the curriculum, teachers provide students the chance to experiment with immersive and interactive learning environments where they can create, test, and refine their own game ideas as a means of learning important subjects. In addition to teach useful skills applicable to fields like technology, design, and entertainment, game design encourages deeper engagement through practical, experience learning (Steinkuehler & Duncan, 2008). The paper concludes by discussing the challenges of integrating gamified activities such as time management, assessment alignment, and maintaining academic rigor and proposes a framework for embedding game-based learning within the broader urban design curriculum. In sum, this innovation highlights the potential of game group activities as a compelling strategy to energize urban design education, making it not only more fun and interactive learning, but also effective in cultivating future-ready urban designers.

1.1 Game-Design Approaches in Education

The potential of game-design approaches in education to improve student motivation and engagement has drawn attention, especially through gamification and game-based learning. In order to create a competitive, goal-oriented setting, gamification involves bringing game elements such as leaderboards, badges, and points into educational environments (Anderson & Dill, 2000). This approach encourages active engagement and develops abilities like critical thinking, cooperation, and visual comprehension (Kapp, 2012) by implementing structured activities like urban design challenges, where students collaborate in groups to address real-world problems. In contrast, game-based learning (GBL) encourages creativity and risk-taking by immersing students in challenging problem-solving settings through real games. For instance, students can interact with urban planning, decision-making, and system complexity through simulation games such as SimCity or Cities: Skylines (Gee, 2003). These methods work especially well in urban design education, as future professionals need to be able to collaborate and overcome problems. The integration of serious games and collaborative game elements further enriches the learning experience by offering immersive, real-time feedback and promoting both teamwork and individual growth (Steinkuehler & Duncan, 2008). Students can experiment with urban design concepts without worrying about the real-world repercussions by playing challenging games that simulate real-world problems, such sustainable urban planning. It has been demonstrated that these game-based interventions raise student motivation, foster peer engagement, and boost learning confidence (Kapp, 2012). Students are urged to use their theoretical knowledge in a real-world setting with a lot of stakes by means of competitive components like design wars or planning contests. Therefore, by developing dynamic, interactive learning environments that encourage deeper involvement and better results, game-design approaches provide substantial advantages in urban design education.

1.1.1 Game-Base Learning (GBL)

GBL refers to *"the pedagogical approach of utilizing games in education"* (Anastasiadis & et.al, 2018). It is a teaching methodology that primarily uses games, whether they be digital or physical, to get

students interested in what they are studying. It makes use of games' immersive, interactive qualities to help students solve problems, think critically, and work together. By placing students in authentic situations where they must apply their knowledge, make decisions, and consider their options; GBL promotes active engagement. With game components like challenges, incentives, and progression systems, students are frequently more involved in the learning process, which increases motivation (Gee, 2003). It has been demonstrated to enhance creativity, cooperation, and cognitive abilities, which makes it especially useful in fields like urban design that call for intricate decision-making (Kapp, 2012). By using game mechanics and narratives, GBL fosters a deeper, more interactive learning experience that goes beyond traditional instructional methods.

1.1.2 Gamification

Gamification is defined as the *"use of game design elements in non-game contexts"* (Deterding et al., 2011). It is the process of incorporating game features and mechanics-like challenges, leader boards, badges, and points—into non-gaming environments in order to increase user motivation, engagement, and involvement is known as gamification. By making traditional learning experiences more interactive and competitive, gamification in education seeks to motivate students to meet predetermined learning objectives by providing them with incentives analogous to those found in games. Gamification boosts intrinsic motivation and creates a sense of accomplishment by incorporating components like peer competition or prizes for advancement (Anderson & Dill, 2000). By encouraging consistent effort and engagement with the course material, it improves learning outcomes by utilising the allure of games to make assignments more pleasurable and to encourage students' active participation (Kapp, 2012).

1.1.3 Game Design in Curriculum

In order to improve student learning and engagement, game design in curriculum refers to the incorporation of game development concepts, tactics, and mechanics into educational initiatives. This method, which is frequently used in diverse environments including software development, storytelling, and visual design, enables learners to use creative problem-solving, critical thinking, and collaborative abilities through game design. By integrating game design into the curriculum, teachers provide students the chance to experiment with immersive and interactive learning environments where they can create, test, and refine their own game ideas as a means of learning important subjects. In addition to teaching useful skills applicable to fields like technology, design, and entertainment, game design encourages deeper engagement through practical, experience learning (Gee, 2003); (Steinkuehler & Duncan, 2008). It serves as a powerful tool to merge creativity with technical skills and encourage active learning in subjects traditionally considered passive or abstract.

2. METHODOLOGY

This project involves four stages which are *Exploration and Contextual Understanding, Design and Development* of the game, Implementation in Class and finally *Evaluation and Reflection*.

I. Exploration & Contextual Understanding

The first stage involves the understanding of the project. The objective is to understand the current pedagogical approaches in urban design education. In this stage, the authors did the literature review on the topics and curriculum of Urban Design studies in UiTM Cawangan Perak. The game will be held in the subject TPR511 Urban Design and Public Life which is part of syllabus for the Bachelor of Town

& Regional Planning (Hons) CFAP221. The topic covered includes Urban Design Principles, Urban morphology and Urban design theories.

II. Design & Development of the game: UrbanQuest – Walk and Design Scavenger Hunt

The objective is to adapt playful learning tools for urban design learning. In this stage, workshop is conducted with the teaching team and urban design-based educator on the game design. The game created is called UrbanQuest – Walk and Design Scavenger Hunt. The game objective is to explore real urban environments, identify challenges and opportunities, and develop small-scale design interventions using creative, site-based exploration. This stage includes designing the Scavenger Clue Cards with sets of questions, a Reflection Sheets and Design Proposal Template. The learning outcomes are students will be able to practice critical observation and site analysis. They will be able to identify and respond to real urban challenges. And finally, they will be able to build their context-awareness.

III. Implementation in Class.

The purpose of this learning approach is to deploy and observe the game-based activities in the actual urban design classes. At this stage, the game was implemented during tutorial session and is conducted practically on site. One of the elements that is important to be observed is the active participation and engagement among the students. A pre-survey is given to the students to test their basic knowledge on urban design. The game is done outside of the class, for example at the nearby township or in the campus itself. The game is held in 90-120 minutes. Students are divided into 3-4 teams. The first phase of the game is the kick off briefing, where the rules and regulation of the game, safety, timing and deliverables where explained to the students. Students are given around 60minutes to start hunting and observing. Students explore their zone with clue cards in hand. Students are required to take photos, notes and sketches. Interaction with locals is bonus points for them. After that, students are required to gather in studio to propose interventions for their area using sketches, quick models or moodboards. Frame them as “Urban Design Hacks”. Finally, the group will pitch their findings and design ideas.

IV. Evaluation & Reflection.

The objective is to access learning outcomes and player experience. This stage is the final stage where student performance was identified and analysed. Lecturers are open to use Urban Badge system for fun achievement such as “Best Sketch”, “Brave Interviewer”. Post surveys were done to identify the knowledge gain. Statistical analysis was done to analyse the data obtain.

3. FINDINGS

A survey has been conducted to the students to the the UrbanQuest – Walk and Design Scavenger Hunt game. All the feedback received was positive. Students reported that the game helped them better understand how to observe and analyse urban design elements. Many found the game format is exciting and enjoyable. The game fostered communication and teamwork, as students worked together to solve challenges and navigate urban spaces. Additionally, lecturers noted that the interactive nature of the game fostered critical thinking, collaboration and creativity among students. Students demonstrated a stronger ability to apply design interventions in response to urban complexities after engaging in the activity.

4. CONCLUSION

The integration of game-based group activities in urban design education marks a significant advancement in teaching methodologies, aligning with the evolving trend toward student-centered learning. The novelty of this innovation lies in its structured use of gamification principles that simulate real-world urban challenges, creating a highly interactive and immersive learning environment. By embedding these engaging games within the curriculum, the approach fosters collaboration, creativity, and critical thinking among students. As a result, students develop practical skills essential for professional urban design practice while deepening their understanding of complex design principles. Despite challenges in implementation, such as managing time, this pedagogical innovation presents a promising strategy to enhance educational outcomes. The use of gamified learning tools offers an effective way to prepare future urban designers for the demands of their profession, making education more interactive, fun and enjoyable.

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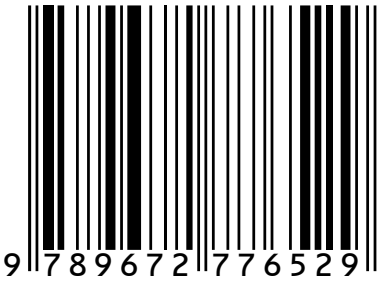

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