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The application of gamification in student learning: Efficacy and Implications

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Extended Abstract

Student induction serves as the first step of the learning journey, helping students understand the resources, facilities, and supporting infrastructures in the learning environment. A positive induction experience helps improve better learning efficacy and boost performance later on. However, students nowadays complain induction as boring, time-wasting and useless. Given the importance of induction, scholars have called for new research, finding a new way to deliver better-quality and more engaging induction. To respond to this call, the current research aims to investigate whether gamification offers better induction experiences to the students. Gamification is the use of game design techniques, game thinking, and game mechanics in a non-game context. Drawing on the student-centred learning theory, we propose that, through the game-play process, students shall feel less stressed but more confident in learning, leading to a more positive learning experience and outcome. Following the same logic, we hypothesise that gamification is positively correlated with the experiences of induction. That is, gamification-empowered induction brings better experiences to the new students.

To examine the research hypothesis, we plan to recruit 200 students (research participants) through flyers and noticeboards during the university induction period in September 2023 (Ethics Approval Ref: ETH2223-0198). The recruitment is operated on a voluntary basis and participants can drop out at any time. Participant Information Letter, Consent Form, and other participant protection measures are arranged in line with the guidance of institutional ethics committee. The participants will be randomly assigned into two conditions. In Condition A, participants will receive a conventional induction through a regular teaching classroom. All documents and instructions are communicated through paper-based handouts. Participants will receive a campus map, explaining the location of buildings and respective services. The induction will be completed inside the classroom. In Condition B, participants will receive gamification-empowered induction. All documents and instructions are communicated through a gamification APP (to be installed in participants' mobiles). To complete the induction, participants must visit the designated locations in the campus, exploring the services in person.

To further understand participants' views and experiences of the induction, we plan to collect data through anonymous questionnaires surveys at the end of induction. Condition A will receive questions through web-based surveys, where Condition B will receive questions through APP-based surveys. Both conditions will receive the same survey questions, and Condition B will receive additional questions of APP-user experiences (A copy of the survey questions is enclosed in appendix). The data collected will be analysed and compared through SPSS and Excel software. Research findings will first and foremost examine whether gamification-empowered induction offers better induction experiences to the students. The answers will bring new insights to the gamification-induction literatures. Research findings will be important to the teaching practitioners and policy makers, particularly for those who wish to create better induction programmes through innovative strategies. Implications on induction design and delivery will be clarified. Research limitation and suggestions for future research will also be discussed.

Keywords: Gamification; Induction; Induction Programme; Learning; Students.

Introduction

‘The student induction is dull!’

‘Attending the induction wastes my time!’

‘I almost fell asleep during the induction!’

University students often complain their induction experiences, such as boring slides, non-interactive materials and long-sitting hours. But, does induction really matter? Does induction help students in their learning and assessment? Following these questions, scholars from universities and colleges have proposed a series of views. For instance, Moir and Gless, (2001) indicate that student induction serves as the first step of their learning journey, helping students understand the resources, facilities, and supporting infrastructures in the learning environment; namely, a positive induction experience helps improve learning efficacy and enhance performance later on. Through a social interaction-inspired research, Gehlback, Masico and McIntyre (2023) have discovered that students with induction experience may perceive more positivity in their relationships with their teachers and obtain higher course competency scores. A well-designed induction is crucial to the learning per se, which helps people acquire new knowledge, skill, opportunity for personal and professional growth (De Felice, Hamilton, Ponari & Vigliocco, 2022; Motta & Galina, 2023). Due to the importance of induction, scholars are always keen to develop and adopt innovative ideas in running student induction and related activities, aiming to deliver a better induction experience to the new students (Brown, Bull & Pendlebury, 2013; Guo, Saab, Post, & Admiraal, 2020).

Following the studies of student induction, the concept of gamification has been proposed to the induction practitioners, such as university lecturers, business mentors, and organisational managers (Almeida & Simoes, 2019). Gamification is seen as application of game(s), allowing game players (e.g., users, learners) to understand situation, acquire knowledge, and learn skills through the interplay of games (Clark et al., 2023; Deterding, Dixon, Khaled & Nacke, 2011). Gamification is the utilisation of game design techniques, game thinking and game mechanics to enhance non-game context (Nicholson, 2015). That is, gamification adds 'game-related ideas and applications' into non-game environments. Gamification has been applied to business activities, vocational apprenticeship, employee management and many other fields. For instance, businessmen apply gamification to the online marketing strategies, encouraging their customers to experience new products or services (Deterding et al., 2011). Mentors apply gamification to the apprenticeship-related activities, creating an immersive learning environment for the mentees (Almeida & Simoes, 2019). Managers apply AI-driven gamification in the employee induction programme, enabling an interactive and supportive 'settle-in' process (Chang, 2020; Freitas & Griffiths, 2007). Simply put, gamification has earned its name from its great applicability and merits.

In the field of student induction (*the first step of learning*; Moir & Gless, 2001), the utility and development of gamification is still at its infancy stage. Scholars have proposed a few interesting viewpoints, but their findings seem contradicting to each other. For instance, a group of researchers claim that, compared to the students who learn in the conventional classroom, students who learn in a gamification-embedded environment have higher levels of engagement and commitment, leading to a better academic performance (Hamari et al., 2014; Hanus & Fox, 2015). Having said this, however, another group of scholars indicate that the design and implementation of gamification is based on 'virtual-world', which does not necessarily reflect all factors in reality, not to mention the subtle interactions between factors.

Thus the efficacy of gamification in student learning activities should be interpreted with caution (Clark et al., 2023; Deterding et al., 2011). Overall, the previous research has implied two important messages: i). although different in research design and objectives, prior studies jointly have offered preliminary credence to affirm that gamification has a potential applicability to the student induction; and, ii). the debates between gamification supporters and questioners seem never ending, jeopardising the reasoning and consolidation of gamification theories (*see relevant remarks in*: Nicholson, 2015; Subhash & Cudney, 2018). Scholars' mixed viewpoints do not contribute to the clarification of gamification effect in student induction, leaving a glaring knowledge gap. To fulfil the gap, we therefore propose a new research, along with the following reasons:

Firstly, continuing the debates between gamification supporters and questioners does not necessarily help explain the effect of gamification in student induction, in line with the prior comments (e.g., Landers et al. 2015; Nicholson, 2015). Adopting an empirical approach to scrutinise the gamification effect in student induction would be more practical and sensible. We hope research outcome will help enlarge the shadow between supporters and questioners, hence advancing the gamification-induction related knowledge. *Secondly*, prior studies have called for new research, so different viewpoints of gamification effect can be further scrutinised, compared and critically discussed (Hamari et al., 2014; Hanus & Fox, 2015). It is our belief that research findings will contribute to the synthesis of various viewpoints and heterogeneous perspectives, bringing new insights to the 'gamification-induction literatures'. *Finally*, the understanding of gamification's design, implementation and efficacy in learning is not always clear (e.g., Deterding et al., 2011; Hanus & Fox, 2015; Subhash & Cudney, 2018). Developing a more in-depth understanding of gamification-empowered learning through research has become crucial, as research findings will help teaching practitioners maximise the merits of gamification in their teaching and induction practices.

Literature Review

To our understanding, student induction is a purpose-built event, comprising a series of events and activities held at the beginning of the programme, such as the commencement of new academic year. Broadly speaking, student induction is a student-oriented event, welcoming new students to the learning environment (e.g., campus, organisation), in which tutors offer information of the learning programmes, expectation and requirement, assessment and support involved in the programme. Student induction has different forms and styles, such as formal or informal, inside or outside the classroom, online, in-person or hybrid. Our proposition is: *student induction helps students settle into and navigate the new learning life.*

Construct and function of the student induction

From an academic perspective, student induction does matter. A well-designed induction programme helps students understand the programme requirement and expectation from the beginning of their learning journey (Moir & Gless, 2001). Student induction offers a great chance of transition, which is a process of identity development and change, brought through complex interactions between students, staff and institutional context, all shifting over time (O'Donnel et al., 2016). Student induction carries different merits, ranging from better staff-student relationship (Gehlback et al., 2023), higher learning efficacy and personal growth (De Felice et al, 2022; Motta & Galina, 2023), better performance (Brown et al., 2013; Guo et al., 2020) to the sense of belonging (O'Donnel et al., 2016). In view of what has preceded, we have learnt that student induction is absolutely essential to the students, not only helping

students settle into the learning environment, but also guiding students to network with new people and get their bearings.

However, in the eyes of students, their experiences of induction seem somewhat different from the induction providers (tutors, lecturers). Actually, although a bit embarrassing too, we authors also have heard negative comments from our students; for instance, some students describe induction programme as boring, time-wasting or ineffective (*see relevant discussion in*: De Felice et al, 2022; Motta & Galina, 2023). Given the importance of student induction, scholars have called for new research, finding a new way to improve the quality and delivery of student induction (Gehlback et al., 2023; Guo et al., 2020). Following this line of research, the concept of gamification has been introduced to the academic world. This article now turns to explain the gamification and its applicability in student learning and induction.

Gamification and its applicability in student learning and induction

In layman's term, gamification means playing games in a non-game environment. Scholars have proposed a variety of definitions of gamification (e.g., Almeida & Simoes, 2019; Clark et al., 2023; Dixon et al., 2011), and the following definition is adopted in the current research, due to its popularity and well-acceptance in the same field; that is, '*gamification is the use of game design techniques, game thinking and game mechanics to enhance non-game context* (Nicholson, 2015)'. Originally gamification is used to improve the engagement of game players, stimulating the sales of games and enriching the gaming experiences (*c.f.*, persuasive system design; Robson et al., 2015). More recently, gamification has extended its applicability to organisational productivity (Zichermann & Cunningham, 2011), knowledge retention (Dincelli & Chengalur-Smith, 2020), personnel recruitment practices (Hamari & Koivisto, 2015a) and exercise management (Hamari & Koivisto, 2015b).

The application of gamification is often polymorphous and versatile, and scholars have praised its efficacy in different sectors, for instance: i). *Healthcare Sector*: Gamification is found to improve the efficacy of therapy; specifically, when patients engage in gamification-style activities (i.e., an alternative style of the therapy), they are more likely to demonstrate health-related behaviours and benefit better well-beings (Landers et al., 2015). The rationale is: although gamification does not cure the illness directly, it may help patients facilitate the process of recovery in a psychological manner; ii). *Retail Sector*: When managers apply gamification to the training programs, employees may acquire the job knowledge and skills through the gamification activities more effectively, which in turn improve the employee engagement and overall productivity (Hamari et al., 2014). The underlying mechanism is: as the nature of gamification is game-play (e.g., learning through gaming activities), employees may feel less stressed and more confident in learning, hence leading to a more positive learning experience and outcome; iii). *Education Sector*: Based on the meta-analysis, scholars have claimed that gamification is an effective method for instruction, as the gamification is found to contribute to the cognitive-, motivational- and behavioural-learning outcomes (Sailer & Homner, 2020). Very likely, through the gamification, the learning process has become more engaging, in which individuals can interact with the learning subject and knowledge more closely, such as understanding the new knowledge (e.g., concept, theory) through personal knowledge and experiences (Hanus & Fox, 2015); and, finally, iv). *Education Governance Sector*: scholars have found that '*gamified learning*' improves class participation and performance, as learning through games improves students' interests and engagement (Subhash & Cudney, 2018). Fuzzy logic (a type of gamification in student learning) also improves the levels of knowledge acquisition and reduces the dropout rates, in

which gamification plays both direct- and indirect-role in facilitating the learning outcome (Troussas et al., 2020).

Although different in nature, prior studies jointly have conveyed a clear message that gamification provides an ideal environment for students learning, leading to a positive learning experience and outcome. Compared to the conventional learning environment, gamification-empowered learning environment has offered different but valuable merits, such as more confidence in the learning process, more interaction opportunity with the subject knowledge, and less anxiety in acquiring new knowledge. Following the same logic, we propose that gamification can be applied to the student induction environment, particularly when the induction is often regarded as the important part of learning (Moir & Gless, 2001). To further discuss the applicability of gamification in student induction, this article now turns to review and discuss the proposed gamification-empowered student induction through theories. Details follow:

Gamification-empowered student induction through a theoretical lens

To further understand the applicability of gamification in student induction, we adopt a classical learning theory, i.e., *student-centered learning* (SCL: McKeachie, 1986; Meyers & Jones, 1993) as an overarching framework in the following analysis and discussion. Our proposition is: when adopting a student-centered learning approach, tutors (e.g., lecturers & teachers) shift the focus of activities from themselves to their tutees (e.g., learners & students); that is, SCL offers tutees the opportunity to decide *what material they learn* and *how they learn it* (Felder & Brent, 1996). Under the SCL environment, learners are able to create new knowledge (cognitive learning channel), develop feelings and emotions (affective learning channel), and enhance physical and manual skills (psychomotor learning channel); all together, through different learning channels, learners experience the learning processes and acquire the knowledge gradually (McKeachie, 1986). From a different but relevant perspective, Meyers and Jones (1993) indicate that SCL outperforms conventional student-learning practices, as SCL provides students with ample opportunity to enlarge their learning capacity, facilitating positive interdependence and individual accountability.

Inspired by the SCL theory, we propose that gamification can enrich student learning and improve their learning efficacy in three possible ways: *Firstly*, gamification offer game-like learning activities, in which learners develop their understanding of subject knowledge through the interactions with game (Clark et al., 2023; Deterding et al., 2011); namely, gamification offers a knowledge-transferring channel, so learners acquire the knowledge from the knowledge base to themselves (*coherent with the cognitive learning channel*; McKeachie, 1986). *Secondly*, under the gamification-learning environment, new employees may learn their organisational policies and operational guidelines through the game-led induction programs and complete their ‘settle-in’ process in a more confident and comfortable manner (Freitas & Griffiths, 2007; Nicholson, 2015), in addition to the support from managers and colleagues (*coherent with the affective learning channel*; McKeachie, 1986). *Thirdly*, in the workplace, mentors can apply gamification to their apprenticeship-related activities, creating an immersive learning environment for the mentees, in which mentees can develop a better understanding of the job nature and requirement, improving their job skill, knowledge and profession (Almeida & Simoes, 2019; Hanus & Fox, 2015) (*coherent with the psychomotor learning channel*; McKeachie, 1986).

Overall, from different perspectives, prior studies together have offered a preliminary credence to support our proposition that gamification can be applied to the student induction,

in which gamification supports learners acquire knowledge and facilitate their learning efficacy through cognitive-, affective- and psychomotor-learning channels.

To summarise, the literature reviews and critical discussion above have affirmed that gamification comprises unique merits and applicability in enhancing student learning motivation and engagement. Through the gamification-empowered learning environment, learners shall feel more sense of autonomy and confidence, and less sense of stress and anxiety. Following the same logic, we believe that students shall feel more competent and supportive in a gamification-empowered learning environment, leading to a more positive learning journey. As such, we propose the following research hypothesis: *gamification is positively correlated with the perception of induction*. That is, gamification-empowered induction brings better experiences to the students than the conventional induction.

Methodology

Design and procedure

To examine the research hypothesis aforementioned, we first propose a mixed method approach, in which both interview and questionnaires are designed for data collection. However, due to the ethical concerns of interview method and its implications on students induction experiences (e.g., students may feel more stressed in induction if interviewed, and/or researchers may have limited time in conducting interviews within the tight induction programme), we have been advised to drop off the interview method for data collection.

Specifically, an anonymous questionnaire survey is permitted by the institutional ethics committee (Ethics Approval Ref: ETH2223-0198). We plan to recruit 200 students (research participants) through flyers and noticeboards during the university induction period in September 2023. Participants will be recruited from the University of East London, UK. The recruitment is operated on a voluntary basis and participants can drop out at any time of the data collection process. Participant Information Letter, Consent Form, and other participant protection measures are arranged in line with the guidance of ethics committee. The participants will be randomly assigned into two conditions (see Table 1 for details).

Table 1: Summary of the manipulation

(Condition)	Sample size	Manipulation of the conditions
Condition A	100	● Venue: Classroom (All documents and instructions are communicated through paper-based handouts). ● Survey: Student Induction Experience Scale ● Mode: Participants complete induction in the classroom.
Condition B	100	● Venue: Campus (All documents and instructions are communicated through a Gamification-APP) ● Survey: Same as above, plus additional questions for the APP users. ● Mode: To complete the induction, participants must visit the campus physically, exploring the location of buildings and services in person

Manipulation of the conditions

In Condition A, participants will receive a conventional induction through a regular teaching classroom. All documents and instructions are communicated through paper-based handouts. Participants will receive a campus map, explaining the location of buildings and respective services. The induction will be completed inside the classroom. In Condition B, participants will receive gamification-empowered induction. That is, all documents and instructions are communicated through a gamification APP (to be installed in participants' mobiles). To complete the induction, participants must visit the campus physically, exploring the location of buildings and services in person. A post-survey check will be arranged to understand the manipulation efficacy.

Measurement

During the questionnaire surveys, participants from both conditions will respond to the same questions, i.e., '*Student Induction Experience Scale* (Details are outlined below)'. All questions are preceded with a prelude: '*Please read the statement carefully and give your answers accordingly. There is no right or wrong answers, please feel free to express your viewpoints. Thank you.*' Responses are collected using 6-point Likert scales (1= completely disagree, 6=completely agree). A sample question is arranged to help participants settle in the survey. Apart from the scale, Condition B will receive additional questions about the experiences of Gamification-APP users (Details are outlined below).

Moreover, as it is mentioned above, we are advised to drop off the interview method for data collection. To rectify the absence of qualitative data in analysis, we have proposed an 'open question' at the end of survey for both conditions, allowing the collection of narrative comments for further analysis. The open question is written below: "*Do you have any comment and/or suggestion for the induction? Please feel free to give your views here. Alternatively, please enter 'no comment'. Thank you*".

Development of the student induction experience scale (for Conditions A and B)

Previous research has indicated that a positive induction experience helps facilitate better learning efficacy and enhance performance later on. Following this logic, prior studies of student induction (Gehlback et al., 2023; Moir & Gless, 2001) were revisited to develop a new '*student induction experience scale*', in line with the three-staged scale development process (Hinkin, 1995):

Stage 1 (item generation): We collected the information of student induction using Sample 1 (6 students & 5 tutors). We requested the sample to provide any induction-related comments that they heard or experienced in the past three months. All comments were cross-checked to avoid duplication. To improve the construct validity and clarity of comments, unclear-, incomplete-, and confusing-comments were deleted. Stage 1 produced 57 comments, yielding the average rate of 5.18 comments per person.

Stage 2 (scale development): 57 comments were analysed through an exploratory factory analysis using Sample 2 ($KMO = .91$, $\chi^2 (421)$, $p < .001$). The results suggested five principal factors (Eigenvalues = 47.69, 16.30, 10.70, 5.24 & 3.97, respectively; accumulated variances = 83.91%). To refine the findings further, we adopted the guidance of Tabachnick and Fidell (2007), i.e., factors with lower loadings (0.33) were omitted, and the items with cross-loading

on multiple factors were also omitted. This refinement process produced 37 items (comments) in total.

Stage 3 (scale evaluation): 37 items were further analysed through an exploratory factory analysis using Sample 3 ($KMO = .90$, χ^2 (276), $p < .001$). The results suggested three principal factors (Eigenvalues = 53.79, 8.46, & 5.48, respectively; accumulated variances = 67.73%). We adopted 'item analysis' to refine the internal consistency of three factors, in which the items with low contribution to the reliability improvement were removed (Hinkin, 1995), and the outcome informed a new scale of 24 items. Specifically, the scale comprised three dimensions, including: 'Academic & learning environment (Cronbach alpha $\alpha = .94$, Convergent Validity = .77), 'Career and curriculum activities (Cronbach alpha $\alpha = .91$, Convergent Validity = .74), and 'Assessment and learning support (Cronbach alpha $\alpha = .94$, Convergent Validity = .69). The average variance extracted values of three dimensions (AVEs = .60, .56 & .60) were higher than the concerned correlation squares and conventional acceptance threshold (.50; Fornell & Larcker, 1981), so the discriminant validity of three dimensions was established. Jointly, these statistic figures affirmed the reliability and validity of the newly-developed 'Student Induction Experience Scale' (See Appendix 1 for full list of questions).

Additional questions for the gamification-APP users (for Condition B only)

To our knowledge, the application of Gamification-APP in student induction is relatively new (see relevant comments in: Motta & Galina, 2023; Williams et al., 2013). To further understand the user experiences, we therefore crafted several questions for a mini survey (15 participants) during the APP development period. The outcome informed the following eight questions, including: i). the APP makes the induction process more engaging for me; ii). the APP introduces me to campus life effectively; iii). the APP clarifies university policies and procedures; iv). the APP provides a clear understanding of academic requirements; v). the APP features are easy to navigate; vi). the APP helps me feel connected to the university communities; vii). using the APP helps me connect with other students; and, finally, viii). the APP meets my needs as a new student. These questions will be analysed individually but can be merged as scale for further analysis, owing to the sound internal consistency (8 items, Cronbach alpha $\alpha = .93$).

Development of the gamification-empowered induction

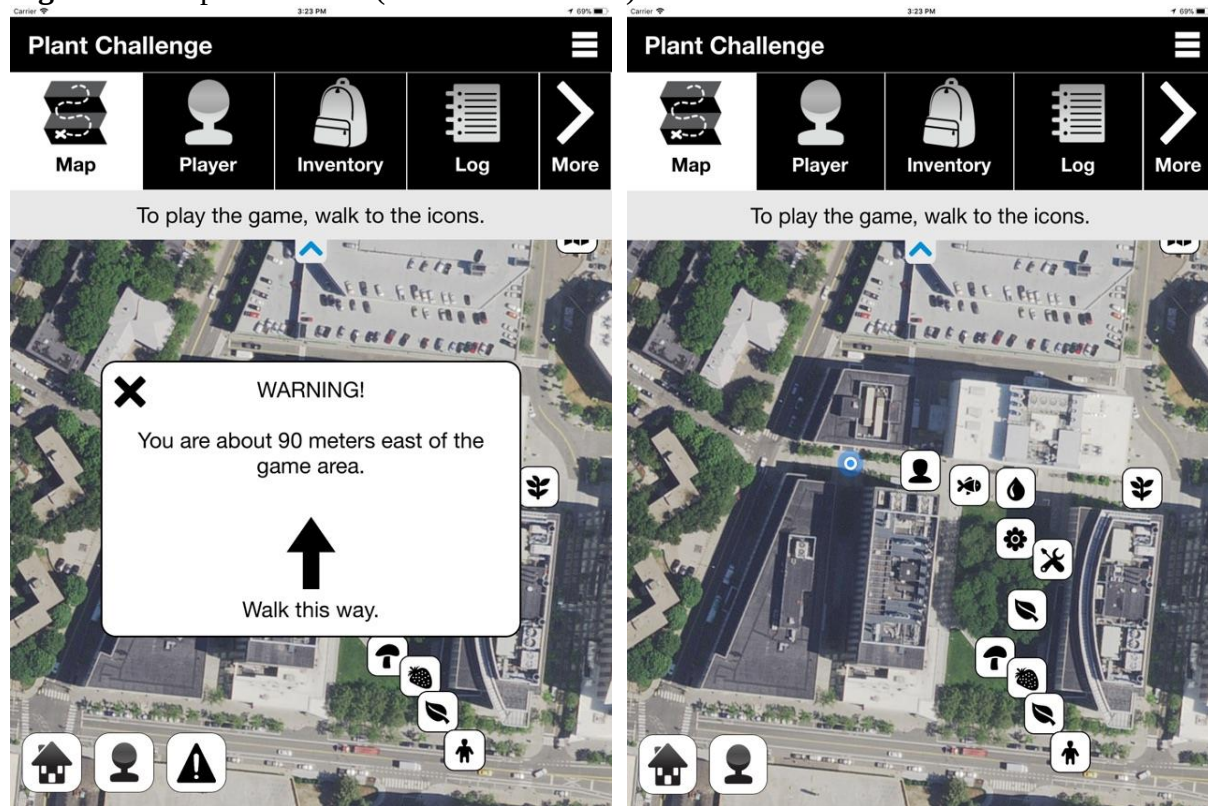
To create an environment of gamification-empowered induction, we have developed a mobile APP using TaleBlazer (open-source software), which is a location-based and augmented reality game platform (Cervi-Wilson & Brick, 2018). With the support and guidance from the APP, people may play games in the real world, and use APP as a gateway for interactions with the virtual world (Lee, 2019). Texts, images, audio- and video-animations are also used to enrich and entertain the game content (Hung, 2015). Details are outlined below:

Design. In the gamification-empowered induction, when the participants move around the campus, the APP senses their location with the global positioning system (GPS; Milner, 2016), which in turn streamlines with the actual location (e.g., library, lecture theatre, student centre), allowing the participants to interact with scenario-based games (Details are available below). At the beginning of induction, participants will gather together in the induction classroom. Following the instruction of researchers, participants will install the APP into their mobiles, so they can enter the gamification-empowered induction. At the end of induction, participants will uninstall the APP, so no further information will be gathered (as per ethical

guidelines). Research assistants are nearby, supporting the game players (participants) if necessary.

Scenario-based games. Participants (Condition B only) are invited to act as ‘detectives’ and their task is to explore the target-locations in the campus and find out treasures accordingly (See Figure 1 for sample scenarios). For instance, participants shall locate where the library is and explore what service(s) are offered there. Participants must visit the location in person to claim the reward points (The less time in reaching the location, the more points are rewarded). Once all locations are visited, participants will return to the induction room (where they start in the first place). Points will be calculated and the winners will be awarded with book vouchers. Participants will also receive a research e-briefing, including the contact details for any questions and/or suggestions.

Figure 1: Sample scenarios (Mobile Screenshot)



Target locations. Due to the limited time in the induction programme, only the major locations are selected for the gamification-empowered induction. These are: for instance, library, student centre, IT service centre, student canteen, student visa office, accommodation office and bus/tube station. These locations provide ample interaction opportunity to the participants, such as exploring the campus, visiting the buildings, inquiring the services, and playing the games to know where has what (e.g., IT centre can lease laptops). The interactive games are found to improve both learning motivation and experiences (Cervi-Wilson & Brick, 2018; Clark et al., 2023), so we assume that gamification-empowered induction shall bring more positive experiences to the participants, such as the students in Condition B.

Validity of the gamification-empowered induction. Once the APP is developed, it will be first examined and refined by the software (e.g., error checking & parameters correction), yielding the first line of validity (Cervi-Wilson & Brick, 2018). Then, the APP will be tested

by human users (researchers) and further improved, yielding the second line of validity (*see similar procedure in: Lee, 2019*). When the APP is used to create a gamification-empowered induction, the views and experiences of APP users (participants) will be collected, helping clarify the effect of gamification-empowered induction, and hence yielding the third line of validity. Based on prior studies of gamification in learning (e.g., Almeida & Simoes, 2019; Deterding et al., 2011), we believe that our gamification-empowered induction is logically-designed and theory-informed, leading to the sensible research validity.

Expected Research Findings

As the data will be collected in September 2023, no analysis is carried out at present. Once data collection is completed, basic checks will be arranged, such as control variable analysis and common method variance checks. By using EXCEL and SPSS software, we plan to run a series of inferential statistical analyses, ranging from scale reliability/validity checks, means comparison, correlation- and regression-analyses, and multivariate analyses. Statistical outcomes will help clarify whether gamification is positively correlated with the perception of induction, accepting or declining the research hypothesis. That is, research findings will help explain whether the gamification-empowered APP brings a better induction experiences to the students.

Expected Research Outcome and Impact

Inspired by the literatures of gamification (e.g., Landers et al. 2015; Nicholson, 2015), we have appreciated the applicability of gamification in student learning. Based on the student-centred learning theory (SCL: McKeachie, 1986; Meyers & Jones, 1993), we have learnt that students would feel more confident and less stressed in a ‘supportive and interactive learning environment’, such as gamification-empowered induction. To further observe and understand students’ perception and experiences of gamification-empowered induction, we have designed a new research and 200 students will be recruited for research participation during the induction period. Overall, the current research is keen to generate both theoretical and practical contributions.

Theoretically, our research is designed to scrutinise the effect of gamification in student induction; specifically, through the gamification-empowered induction, we are keen to analyse how students react to and perceive the induction. It is our hope that research outcome will help enlarge the shadow between gamification-supporters and questioners, hence advancing the gamification-induction related knowledge. Moreover, through the manipulation of the conditions, we can further discuss the similarity and difference between conventional induction and gamification-empowered induction. Research findings will contribute to the synthesis of various gamification perspectives (Hamari et al., 2014; Hanus & Fox, 2015), bringing new insights to the ‘gamification-induction literatures’.

Practically, as previous research of gamification has produced mixed views about its function and efficacy in student learning (e.g., Deterding et al., 2011; Hanus & Fox, 2015; Subhash & Cudney, 2018), we wish our research outcome will help develop an in-depth understanding of gamification-empowered learning. It is our hope that research findings will help university lecturers and teaching practitioners maximise the merits of gamification in their teaching and induction practices. For instance, research findings will contribute to the

University of East London's mission in the area of student learning, engagement and development, which is dovetailed with the University's 2023-2028 Business Education and Development Initiatives. Research findings will also instil MBA and postgraduate students with the latest knowledge of learning environment and strategies (such as gamification-empowered APP for the student induction), which in turn help students develop their skills, knowledge and confidence in learning. This is particularly important as the students have the great potential to become the future leaders. In summary, research findings will be important to the teaching practitioners and policy makers, particularly for those who wish to create better induction programmes through innovative strategies. Research limitation and suggestions for future research will also be reviewed and reported.

Knowledge Dissemination Plan

We plan to disseminate research findings at social media, forums and academic journals. Findings will be shared via social media (e.g., University/School Twitter & Dockland Forum) and professional press media (e.g., CIPD's PM & The Conversation), not for commercial gains, but to amplify our existing research commitment to the community engagement and talent education. Findings will be presented to the reputable conferences (e.g., BAM Conference) and published at the top-quality journals (e.g., *British Educational Research Journal*, *Studies in Higher Education*, and *British Journal of Educational Technology*). As these journals discuss student learning and induction strategies, we wish our research findings will continue this line of discussion, bringing new insights to the student learning and induction literatures.

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Appendix 1: Student Induction Experience Scale

Prelude: Please read the following statement (questions) carefully and give your answers accordingly. There is no right or wrong answers, please feel free to express your viewpoints. Thank you. Responses are collected using 6-point Likert scales (1= completely disagree, 6=completely agree).

Dimension 1: Academic & learning environment ($\alpha = .94$)

1. The induction provided a clear layout of the campus facilities.
2. I was provided with information about academic policies and regulations during the induction.
3. The locations of important buildings, such as the library and computer labs, were explained during the induction.
4. The induction provided information on how to access campus facilities, such as the gym or sports fields.
5. The induction offered guidance on how to balance academic and extracurricular commitments.
6. The induction provided information on how to join extracurricular clubs or societies.
7. The induction provided me with clear information about academic support services.
8. The induction provided me with guidance on how to access academic resources.

Dimension 2: Career and curriculum activities ($\alpha = .91$)

9. The induction provided information about the IT infrastructure and support available on campus.
10. I was informed about the benefits of participating in extracurricular activities during the induction.
11. I was able to ask questions related to the campus infrastructure during the induction
12. The induction provided information about the extracurricular activities available on campus.
13. I was informed about the career prospects after completing my program.
14. I was informed about the safety and security measures in place on campus during the induction.
15. The induction did not provide me with information about alumni networks and job fairs (Reverse coding).
16. The induction informed me about the career development services available.

Dimension 3: Assessment and learning support ($\alpha = .94$)

17. The induction was useful for me to receive information about Moodle and Turnitin.
18. The induction was useful for me to learn tips and strategies for succeeding in assessments
19. The assessment deadlines were clearly communicated to me during the induction.
20. The induction was useful for me to understand the assessment criteria.
21. During induction, I learnt from my tutors, supervisors and program leaders.
22. The induction was useful for me to understand the expectations of the assessments.
23. I had the opportunity to meet with my lecturers or tutors during the induction.
24. The induction provided me with information on the consequences of missing assessment deadlines.