Teachers’ and Students’ Perception of Gamification in Online Tertiary Education Classrooms During the Pandemic

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Abstract
The research aims at investigating the popularity and ease of different gaming-based platforms in relation to multi-disciplines and contexts of English Language learning and teaching, with reference to perceptions, attitudes, motivation, interests, preferences, feelings of ease and other psychological responses among university learners and educators towards the application of different gaming tools in physical and virtual classrooms in Hong Kong before and during the pandemic period. The study then examines to what extent is game-based learning effective in motivating students and teachers to learn and teach better, with a close analysis on the direct and indirect correlations between game-based learning and the level of participation and engagement in face-to-face classrooms and remote learning. The research finally explores learners’ and educators’ technological literacy and training received, with reference to the availability of institutional support towards game-based learning in university English classes in Hong Kong. The study implies the possibility in accelerating future course redesign and assessment restructuring as a result of a switch to the new learning and teaching mode. The research also provides a framework to further study the feasibility in applying gamification in other subjects in the new technological era.

Keywords Gamification · Online learning · Language learning · Face-to-face classrooms · Motivation

Introduction

In the twenty-first century, game playing has become more popular and commonplace. Academics, scholars, educators, and practitioners have been discussing the incorporation of gamification in classroom learning, which is referred as an educational term or even pedagogy used in learning through games to improve students’ English Language competence, since it reflects an innovative and captivating learning activity [7]. This research conducted aims at investigating tertiary learners’ and educators’ perception and attitudes towards gamification in both online and face-to-face classrooms, during and before the outbreak of the pandemic in Hong Kong.

This study also focuses on the practicality and limitations of game-based learning in motivating and engaging students towards sustainable learning in remote and traditional classrooms in higher education in Hong Kong.

Literature Review

There have been studies on the aims and benefits that gamification can bring to classroom learning in a holistic view [1, 4]. A lot of researchers have demonstrated the advantages of technology-based methods in language learning and teaching. In the existing literature, game-based learning is believed to have successfully promoted several kinds of motivational strategies that can be used individually or in combination owing to the visual and interactive features of technological resources which are proved to increase students’ attention span in classes [6]. Instructional technology including computers and other media help minimizing the projection of fear of making mistakes since computers can remain unbiased, accurate and non-judgmental [6]. It is also proposed that game-based learning has undoubtedly changed the academic environments and traditional teaching styles...
by significantly modifying the roles of teachers and students [4]. There have been quasi-experimental studies conclude that Kahoot is a creative and effective tool to promote motivation, engagement and meaningful learning atmosphere among learners. For instance, Kotob et al. [4] have examined the effect of applying gamification strategy to students’ motivation and achievement in specific to Arabic language learning [4].

While the existing literature either focus on the pre-pandemic era or effectiveness of gamification on non-English subjects, the data documented in this research are the results from the respondents and interviewees’ on-going experience in learning and teaching in the years of 2020 and 2019, respectively, which were at times of waves of COVID. The mode of learning and teaching has been switched from face-to-face classrooms to online at all levels in the educational domain. Therefore, studies in the existing literature constitute the framework for further study on the sustainability of one of the most popular gaming tools in classrooms, Kahoot and other gaming platforms, in relation to the validity, effectiveness and possibility of expansion of other innovative and original alternatives to motivate undergraduate students to learn effectively, rather than solely focusing on general ideas about the benefits and limitations of learning through games. In addition, digital learning has become one of the fundamental discourses in language education given the advancement of technology which increases the mobility and fluidity of participants, physical localities and time. The evolution of e-learning has a significant impact on the sustainability of new ways of learning, as illustrated by the physical constraints from e-books to big data. Despite these, the existing research primarily offers macro lenses to the impacts of digital learning, limited research delves in a micro point of view to specifically relate games to English Language learning in universities. Even there are studies analyzing learning grammar through games in the educational discourse, those games are limited to the traditional physical games like storyboards and flashcards but not digital games or mobile applications. Not only are those games outdated and repetitively used through generations, they are usually tailor-made for younger children for learning grammar and vocabulary through games. In general, learning through games are always associated with vocabulary-building tasks and grammar improving. There have been limited analysis on learning and teaching academic English in universities through fun games.

In addition, the investigation of the essentials and practicality of various games in classroom settings are expanded based on the substantial literature review that Kahoot is one of the most popular and manageable gaming platforms appropriated by students and teachers. This research is grounded on the continuous growth of popularity of digital learning platforms and tools in this new technological era, accelerated by the global pandemic, which has been constructing a new canon in experimenting the expansion of learning and teaching technology in classroom settings at all levels. However, rather than solely focusing on students’ learning outcomes, this research juxtaposes and compares the learning and teaching behaviours of both learners and educators, with the measurements of the effectiveness and motivational level towards learning and teaching in face-to-face and online classes before and during the pandemic by both groups of respondents with reference to their real life experience.

While active learning can possibly be cultivated via problem-based collaborative games in a large Mathematics university course in Hong Kong for instance [2], this research paper complements the scarcity of studies on the evolving learning and teaching behaviours in English classrooms in higher education, especially in academic contexts. This can be explained by the fact that the existing literature review are mostly confined to digital classrooms in general but not in the specificity of gaming tools in relation to English Language classrooms in higher education, especially in the setting of tertiary education in Hong Kong. Apart from centering on English Language learning and teaching both offline and online before and during the pandemic in Hong Kong, the study’s other main variables also include the comparison of the effectiveness and motivation levels of various popular games for young adults in English learning acquisition across disciplines with a switch of the types of gaming tools and classroom settings. It is interesting to explore the possibility and potentials to blend in something fun and relaxing in scholarly and serious contexts. This study aims at prioritizing different mainstream gaming tools at the recent moment and recognizing game-based learning as a new form of learning and teaching medium in accordance with the alteration of learning and teaching behaviours among university students and English Language teachers in Hong Kong, and to what extent has this successfully motivated university students for effective learning with a stronger sense of learner engagement.

Different literature reviews have validated abundant research proving games can capture student interest and facilitate active learning; and playful environments are constructive for student engagement. However, the gaming platforms that have been closely studied are normally related to physical and mechanical forms, such as badges, realia, props, playing cards, board games and dices. Emotional elements in gamified classrooms have also been researched into, namely narratives, identities, collaboration, progressive challenges and competitions. However, this research is conducted based on the rationale that most interactive and innovative approaches of learning and teaching in academic contexts are usually practised in western countries, but seldom in academic discourses in Hong Kong. In fact, it is vital
to encourage students to be in charge of their own learning through meaningful activities to discourage them from passive engagement and participation. Active learning promotes independent and critical thinking since learners need to understand and apply what they are learning by engaging in content rather than purely listening. Unlike continuous assessments and examinations, gamification performs the functions of simultaneous learning and captures learners’ interest owing to the avoidance of negative feeling of failure from teachers’ feedback.

Furthermore, it is important to note that the extent of application of gamification in classrooms is hugely determined by the nature of the subject and its specialization. It is said that it would be theoretically easier for educational practitioners to design and implement games for the mathematical and scientific subjects which can be benchmarked by standardized sets of formulas, model answers and computerized systems. In particular, it is more challenging to design and apply gaming platforms for assessments and evaluation of language and humanities subjects due to their subjective nature which depend on individual teachers’ perceptions and marking rubrics. Considering this factor, each class is hypothesized to develop and establish a distinctive set of games each time for every English Language class in universities in Hong Kong given the grading criteria are individualized for the assessments in English Language courses, especially writings in any discourse are normally based on human decisions rather than computerized systems by default. Therefore, this study furthers the impacts of incorporating gaming elements in English Language classrooms in the context of higher education with the comparison of both virtual and face-to-face modes before and during the pandemic in Hong Kong. The collected data are used to evaluate the sustainability of digital learning, the fluidity and flexibility of using various gaming platforms to motivate students’ active learning, and the extent of agreement and awareness of its effectiveness from the perspective of educational practitioners. While the mainstream studies of gamification acknowledge its effectiveness for educational reasons in a macro-view, this research focuses primarily on the analysis of its impacts towards English Language learning in university settings, the ease of its application by students and teachers and the limiting factors in Hong Kong in a regional view. This research forms a fundamental framework for futuristic research of expanding to larger scale of settings, in the response to the adaptability to the ever-changing situations of pandemic in different countries.

One of the main variables of this study includes the investigation of English Language learning from the experience of university students from different disciplines in Hong Kong and university English teachers teaching across curriculum. The data analysis focuses on language learning and teaching rather than mathematical and/or science subjects which rely on computerized systems for the evaluation of students’ learning objectives. While the canon of mainstream study mainly focuses on the macro-view of benefits and limitations of gamification in classrooms in general, this study examines in particular the university contexts in Hong Kong, from the points of views of both learners and educators studying and working in tertiary education. The other variable considers the comparison of the applicability of gamifying classrooms in face-to-face and online classrooms in the aspects of its effectiveness in motivating students for active engagement and frequency of use of games by university teachers in Hong Kong. In fact, most data in the existing literature discourse originate from theoretical principles of gamification and/or digital learning in general but do not specify any particular period of study as a continuous timeline for the comparison of both student and teacher learning and teaching behaviours from both groups of participants. The current data analysis delves in the critical period of global pandemic, which can be argued as a turning point of a substantial transformation in the educational sector. Thus, this research complements the existing discourse to offer a more holistic view on deploying gamification as a motivational tool for university learners by further analyzing the preference of university students and teachers over certain individual types of games in English Language classrooms both physically and virtually, reasons of popularity of those games, the respective ease of application, the availability of resources and support at the institutional levels, and finally recommendations and projections towards the future development, advancement and revamp of courses. Furthermore, this research also considers how gender, social background and level of English Language proficiency of students become dominant factors to govern students’ perceptions of the types of games that teachers should use, which could impact the learning outcomes with different teaching approaches in university classrooms.

The questions that the research is going to address are as follows:

1. To what extent is game-based learning effective in motivating students and teachers to learn and teach better in English Language classes in universities in Hong Kong?
2. What are the direct and indirect correlations between game-based learning and the level of participation and engagement in face-to-face classrooms and remote learning before and during the global pandemic?
3. What are university student and teacher attitude towards incorporating games in classrooms?
4. What are the determining factors governing student and teacher perceptions on the types of games in relation to language competence levels, genders or other dominating reasons?
5. What are the rationales of the design of gaming elements in terms of collaborative and/or competitive and/or a mixed of both in learning and teaching? Which one(s) is/are more preferred by students and teachers for English Language courses in universities in Hong Kong?

Methodology

Two sets of digital questionnaires were first administrated and distributed to university and college students and teachers in Hong Kong in various English Language courses at different levels with 76 respondents, including 69 university and college students and 8 English Language teachers for 1 month in the last quarter of 2021. The time chosen for the collection of data was due to students and teachers’ experience of teaching and learning in virtual classrooms. Once the classroom participants had one semester experience in using online platforms for remote learning and teaching, it forms the basis for advancing the technological platforms to create a simultaneous and interactive learning environment to enhance teacher–student and student–student engagement. Each questionnaire was designed to consist of three sections, which first includes personal backgrounds of participants, followed by the second section documenting questions about students’ perception and preference towards the experience of gamifying classrooms, and the last section asking about teachers’ experience of incorporating games in classroom learning before and during the pandemic in Hong Kong. The questionnaire mainly features the perceptions and the recount of individual experience about using various games in both face-to-face and virtual classrooms among the university and college student group and English Language teacher group of participants. The chosen types of games to be included in each questionnaire are based on the most popular, common and frequently used types of games experienced by the current teachers in terms of the number of users in the educational sector in Hong Kong.

The student sample was selected based on the commonality that they are all Chinese learners of English Language for second language acquisition, who are all students in tertiary education located physically in Hong Kong but using Zoom as the dominant learning platform in their online English classrooms to replace face-to-face classrooms during the pandemic. These students aged between 17 and 22, and varied in terms of different academic backgrounds, disciplines and levels of English competency. Nevertheless, learning English across different curriculums and disciplines has been made compulsory to these learners, and almost all of them have had the learning experience in both face-to-face English classrooms and virtual English classrooms before and during the pandemic era. Likewise, the teacher sample was collected according to the ground that all surveyed and interviewed English Language teachers have at least 5 years’ teaching experience in English across curriculums in tertiary education in Hong Kong. The subsequent voluntary and follow-up interviews were conducted in Zoom afterwards among ten students, in which five of them are male undergraduate students and the other five are female undergraduates. Among the undergraduate interviewees, five are from The Hong Kong University of Science and Technology, while the other three interviewees are from City University of Hong Kong and two come from The University of Hong Kong. The second group of interviewees comprises of eight English Language teachers coming from different universities and colleges, in which three English Language teachers are from The University of Hong Kong, three are from City University of Hong Kong, one comes from in The Hong Kong University of Science and Technology and the other one comes from College of Professional and Continuing Education, CPCE, The Hong Kong Polytechnic University.

Among the student respondents in questionnaires and surveys, a vast majority of them (90.7%) are undergraduate degree students from different disciplines and specializations taking English Language subjects across curriculum among different universities in Hong Kong during the pandemic era. More than half of them (63.2%) are currently studying bachelor degree programmes in The University of Science and Technology, followed by undergraduates from The Hong Kong Polytechnic University (23.7%), City University of Hong Kong (5.3%) and King’s College of London (1.3%). A vast minority of them belong to the group of college students (5.2%) in higher education prior to their admission to universities, who are studying in associate degree and higher diploma programmes in HKU SPACE Community College (2.6%), HKU SPACE Po Leung Kuk-Stanley Ho Community College (1.3%) and HKCT Institute of Higher Education (1.3%). Among them, 37.7% of them are studying in undergraduate degree year 2, followed by 27.5% come from undergraduate degree year 1 and 26.1% from undergraduate degree year 3. Less than 9% of them are associate degree year 1 to year 2 and higher diploma year 1 to year 3 (Table 1).

A five-point Likert scale was used to measure both student and teacher respondents’ level of agreement to the usage of

| Academic programme          | Academic year | Percentage (%) |
|-----------------------------|---------------|----------------|
| Undergraduate degree        | Year 1        | 27.5           |
| Undergraduate degree        | Year 2        | 37.7           |
| Undergraduate degree        | Year 3        | 26.1           |
| Associate degree and higher diploma | Years 1 to 2 | 8.7            |
different gaming platforms as media to enhance the effectiveness and motivation to learn and teach English Language as a second language. During the follow-up interviews, representatives from student and teacher groups were asked to describe and/or compare and/or evaluate the success of one or more than one gaming tool(s) that they experienced in either learning or teaching in virtual and/or physical English classrooms during and/or before the pandemic for validity and reliability of data.

Apart from education background and the level of competence in English Language acquisition, gender also plays a role as determinator of the competence and attitude towards game users in classrooms. Considering this variable, respondents are asked to indicate their gender in the questionnaires. Interestingly, a majority are males (72.4%) while a minority are females (26.3%). In addition, 90.7% belong to the student group whereas 9.3% are English Language teachers in universities and colleges in Hong Kong (Table 2). Further data analysis later reflect how demographic and other gender variants can govern the competence of digital technology, practicability of gamification and thus the effectiveness and success of gamification in classrooms, which influence the level of interactive learning environment and student–teacher relationship in both online and face-to-face classrooms.

Results and Findings

This research juxtaposes the transformation of physical and psychological behaviours of learners and educators towards various game-based platforms in online classrooms from the first semester shortly after the outbreak of COVID-19 till the following academic years and face-to-face classrooms before the pandemic in Hong Kong, with reference to effectiveness of learning, student engagement, motivation and incentive, motivation and effective; and limitations and suggestions. It is generalized that:

a) Most students and teachers have established the habit in using Zoom.

b) Most students and teachers have found it at ease of exploring other digital learning and teaching platforms influenced by the pandemic.

Game-based learning is an interactive learning methodology and instructional design strategy that integrates educational content and gaming elements, by delivering interactive, game-like formats of instruction to learners [2]. Moreover, such learning integrates aspects of experiential learning and intrinsic motivation with game applications have explicit learning goals, thereby allowing learners to engage in complex, problem-solving tasks and activities that mirror real-world, authentic situations [2]. With simulation and physical artifacts, physical classmates could be simulated during the pandemic period.

Learners’ Perception Towards Gamification Among Universities in Hong Kong

Among the student respondents, a vast majority (87%) of university and college students indicate positive perception towards the effectiveness of learning in classrooms through gamification. On the other hand, only 1.4% disagree learning through games is effective. More than one-tenth (11.6%) totally agree that learning through games is effective, while more than half of them (55.1%) strongly agree such teaching strategy is effective. More than one-third (31.9%) believe that it is somehow effective (Fig. 1). In the view of the perception of effectiveness of gamification towards classroom learning from students’ perspective, a majority (73.9%) think that incorporating games is a constructive means to learn. 15.9% regard this approach as the most effective, followed by 58% perceive gamification is very effective in tertiary education and 18.8% are neutral. 5.8% disagree that gamification is an effective pedagogy in helping university and college students to learn better, while 1.4% regard it as the least effective way (Fig. 2).

In correspondence with the measurement of the effectiveness of learning in online classrooms, students’ perception in being motivated to learn through games is a considerable factor contributing to the conclusion whether the learning experience is effective or not. 94.2% of student respondents reveal that learning through games is a significant incentive to motivate them to participate fully in classrooms. In contrast, 2.9% disagree incorporating games in classrooms is effective in motivating students to learn better, while another proportion of 2.9% are neutral towards gamification in classrooms. Regarding the degree of effectiveness of gamification in motivating students to learn better, a vast majority of the student respondents (76.8%) hold the view that learning through games in university classrooms is the most effective (15.9%) and very effective (60.9%), respectively, as a motivational drive to learn better. 15.9% are neutral, whereas 7.2% reckon it as not effective (5.8%) or the least effective (1.4%) pedagogy in motivating learners (Fig. 3).

More than half of them (53.8%) believe the major reason is that learning through games in classrooms is fun, followed by 26.2% regard visuals and colours are more appealing than plain words which come as the second most important concern. Interestingly, more than one-tenth of student respondents (10.8%) explain that they want to win their

| Table 2 Proportion of student and teacher respondents |
|-----------------------------------------------|
| Group 1 respondents                          | Students | Teachers |
| Group 2 respondents                          | 90.7%    | 9.3%     |
fellow classmates which demonstrates peer influence as an important factor in governing the level of class participation. Less than one-tenth (7.7%) feel that gamification encourages them to accomplish tasks through teamwork, which in return motivate them to learn with peers. 1.5% believe that playing games online has become the trend and, therefore, it is necessary to incorporate games in classroom learning (Fig. 4).

Meanwhile, just five student respondents disagree that learning through games can motivate them to learn better. Among respondents who show a negative correlation between gamification and motivation, 40% reckon this can be justified by the common perception that learning is always dull and boring. One-fifth (20%) indicate that even games are incorporated in classrooms, they are incomparable to the fun of video games that they are playing in pastime. Similarity, one-fifth (20%) believe that learning in classrooms should be serious and the other one-fifth (20%) explain their concern that they do not want to communicate with classmates through games (Fig. 5).
Students’ Recount of University Teachers’ Experience in Using Game-Based and Other Innovative Digital Platforms Online and Face-to-Face for English Language Subjects

While the existing literature review focus mainly on benefits and limitations of applying games in classroom activities in general, this study projects a more micro-view and specific approach to evaluate the selected eight types of games based on the popularity and number of users in classroom settings in the world. According to Kotob et al. [4], Kahoot is regarded as the most popular digital tool which encourages creativity and innovation. Among all the game-based platforms, more than half of the student respondents (55.4%) recall the experience of having their English Language teachers using “Kahoot” in their virtual classrooms in their universities or colleges in Hong Kong in both online classrooms during the pandemic and face-to-face classrooms before the pandemic. Shared document serves as the second most common digital tool in the language classrooms, which constitutes almost one-fifth (18.5%) of students have the experience in being asked to use shared document. 7.7% of them have experienced roleplays in English Language classes, followed by 4.6% have used storyboards before. A small minority (3.1%) have used Class123. The other 3% indicate that they have been instructed to use Soqqle and Flipgrid, with 1.5% students out of 3% revealing their English Language teachers have used Soqqle and Flipgrid, respectively. 5.5% reveal that they have never experienced any digital learning tools in classrooms except Zoom as the major communicative classroom platform during the pandemic in Hong Kong (Fig. 6).

Campillo-Ferrer et al. [1] points out that teachers experiment different digital teaching strategies which focus on visuals such as images, paintings and shapes; auditory through rhythms, chants and tones; and kinaesthetic like body movement and gestures to help students to stay engaged with the taught materials in remote learning. Among all, one of these teaching strategies is learning through gamification. With reference to the comparison of frequency of usage of various games in online and physical classrooms, 34.8% of student respondents believe that teachers have been incorporating games in online classrooms as much as face-to-face classrooms. While 33.3% claim that there are more games to be designed in physical classrooms, 26.1% recall more games have been incorporated in online classrooms during the pandemic instead. Only 5.8% cannot recount their learning experience in relation to learning through games in classrooms (Fig. 7).
“Kahoot” is Favoured as the Most Popular Game-Based Platform in Digital Learning Among University Students and Teachers in Hong Kong

Among all the game-based platforms, it is found that Kahoot is regarded as the most popular game by English Language teachers in both online and face-to-face classrooms. It has a user-friendly interface that requires low level of technical expertise and the use of “Kahoot” increases undergraduate students’ motivation because of its easy-to-use implementation [4]. According to a research before and after tests [4], “Kahoot” is concluded to be one of the most effective digital tools which encouraged creativity and innovation. In the studies, it is found that active participation of students stimulates imagination and creative capacity to make learners’ own tests and learn from teachers and classmates. It successfully increases students’ engagement, motivation to learn and their ambitions for success as it creates a stimulating and competitive environment. In fact, both students and teachers can create a positive learning experience using only pictures, video and questions to foster an intensely innovative social learning experience. Furthermore, “Kahoot” is easily accessible by any device with internet connection, smart phones, tablets or laptops. It thus promotes synchronous interaction that encourages real-time collaboration and fosters a sense of community, promoting participatory evaluation that favors the development of cross-disciplinary skills [4]. Furthermore, “Kahoot” and other similar innovative tools have been shown to improve students’ ability to understand the meaning of new information, ask questions, make decisions, and draw conclusions that help fulfil learning outcomes. The results obtained also confirm students’ positive attitude towards the use of such digital platform, which can in return encourage the adoption of these motivating ICT proposals in similar contexts later [4]. With regard to the data on the digital competence of learners, participants welcome these online proposals and feel able to master this platform in terms of game options, basic instructions and question formulations. More importantly, no specific training or complex technical knowledge is required [4]. Given the competitive advantages of Kahoot, particularly the effective outcomes, ease of use, and popularity among learners, it is suggested such application can be extended beyond vocabulary building and grammar teaching but also academic discourse in English Language education in universities in Hong Kong.
University Students’ Comparison of Effectiveness of Gamification in Online Classrooms During the Pandemic Versus Face-to-Face Classrooms Before Pandemic

In this view, there is a significant remark that the popularity of gamification in classrooms lies in face-to-face classrooms more than online classrooms, while there is a similar proportion of student respondents reckon that teachers use games in online classrooms as much as face-to-face classrooms. This illustrates that gamification is not an exclusive approach to be commonly used in virtual classrooms by English Language teachers in universities and colleges in Hong Kong only during pandemic era. On the contrary, the contexts and localities of teaching are not a factor governing the adoption of gamification in classrooms, with or without the impacts from the pandemic and social distancing measures. Considering a small proportion of students fail to recall their learning experience as shown from the questionnaires, the limitations of the effectiveness of using gamification in teaching and learning will be further analyzed in later section.

Implications

Necessity for Gamification in Online University Classrooms During Pandemic and Possible Transformation from Traditional Teaching to Game-Based Learning (GBL)

The promotion of game-based learning (GBL) has undoubtedly changed academic environments and traditional teaching styles by significantly modifying the roles of teachers and students [4]. GBL implies more active participation among students in these learning processes, who respond more effectively to their current interests while such new platform enhances digital literacy, promotes quality and sustainable education [4]. To achieve these objectives, the emergence of new teaching and learning models has encouraged educators, as social actors, to adapt to the needs of learners to develop more motivating and innovative practices [4]. Today, remote controls are no longer necessary because smartphones, tablets or laptops favor the implementation of these systems due to wireless connections to mobile applications and websites. Therefore, content knowledge and fun can be merged into daily lessons without the need for other intermediate devices due to the advancement and application of Information and Communication Technology (ICT).

However, it poses a challenge to discover the dichotomy and contraction between the internalization of necessity of gamification in various modes of classrooms by students and teachers, and the success of gamification in virtual classrooms versus face-to-face classrooms in enhancing the effectiveness of learning and motivations of university students, especially during the pandemic in Hong Kong. Some interviewed students hold the view that online games are equally popular in face-to-face classrooms to online classrooms. Likewise, games in face-to-face classrooms are as much as being adopted by teachers before the pandemic in Hong Kong when compared to online university classrooms during the pandemic in Hong Kong. While it may be deduced that the trend of incorporating different games in university classrooms to make the classes lively and fun is commonplace during the global pandemic period, some students reveal that the process of gamification is actually smoother and more effective in face-to-face classrooms even before the pandemic when online mode of classes have not been adopted. This conforms to the earlier finding that more than one-third of student respondents (34.8%) in the questionnaire highlight that their teachers have been incorporating games in online classrooms as much as face-to-face classrooms. Similarly, slightly more than one-third (33.3%) recall that more games have been incorporated in their formal face-to-face classes in English Language acquisition. While it may be expected that gamification is getting more popular in online classrooms as digital learning has become the prevailing norm in education across different disciplines and sectors accelerated by the global pandemic, games of different categories and pedagogy have been popular in fact for long in face-to-face classrooms even before the outbreak of COVID.

Rather than a surge of popularity of gamification in virtual classrooms, only approximately one-quarter (26.1%) of the student respondents recount their memory of having more games in online classrooms in their learning experience in universities or colleges during the pandemic period in Hong Kong aforementioned. A few interviewed students also conclude that games in online classes cannot serve the purpose of attracting students’ attention during class fully, which means that gamification is a less dominant and significant driving force in motivating students to learn in virtual classrooms since face-to-face presence promises students’ attention span. In addition, it is suggested there is a possibility that some university and college students may just simply ignore the game playing part in classes during online lessons. On the contrary, teachers can ensure every student is engaging in the assigned games in face-to-face classrooms due to the physical presence. In this light, gamification is not the solely effective way to facilitate students’ interaction with their fellow classmates and teachers as much as it is expected. Games cannot guarantee all students are entirely participating in the whole lesson during either online or offline classes. To generalize, all these findings validate the literature review that the trend of gamifying classrooms has been undoubtedly bringing numerous benefits such as facilitating active learning and motivating students to learning.
better, despite exceptional situations that some students may not recognize the effectiveness of incorporating games in classrooms. As professional practitioners, one cannot overlook the possibility of exclusion of passive learners in classroom participation despite the relaxing nature of games. Therefore, it is recommended that there should be alternative strategy from teachers to engage with these minority groups of learners in both physical and virtual classrooms.

**Students’ Preference of Various Gaming Tools and Reasons for English Language Teachers Not Adopting Gamification**

Regarding the categories and nature of games to be incorporated in virtual learning, almost half of the student respondents (47.8%) claim that they prefer both competitive and collaborative games. More than one-fourth (26.1%) prefer competitive games, which compose of the competitive elements among classmates. Level-up games in which students need to proceed to different levels are only popular among less than one-fifth (18.8%) of the student respondents. Collaborative games come to the least popular, in which only 7.2% of university and college students in Hong Kong prefer teamwork during the class activities (Fig. 8).

It is found that university and college students in general have the perception that time is the dominant factor for the absence of gamification in university classrooms. Less than half of them (41.8%) believe that teachers lack time to prepare for games to be incorporated in classrooms, especially during the pandemic era. However, almost one-fifth (19.4%) perceive their English Language teachers are not synchronous with the concurrent trend and thus gamification in classrooms has not been adopted. 16.4% account their teachers may not understand the importance of games, while 10.4% interpret their teachers may not know much about games and 9% believe their teachers may not comprehend the importance and benefits of game-based learning. 1.5% indicate the absence of games in classrooms is due to the difficulty in designing different games for some specific subjects like language, literature and statistics (Fig. 9).

**University Students’ Perception Towards in English Language Teaching in Hong Kong**

It is interesting to find out that students in general:

a) Students tend to equalize whether lessons are fun and interesting as the determinators for their intrinsic and extrinsic motivation in learning.

b) Most of them assess whether their learning experience is effective or not mainly on the basis whether their teachers can keep their attention long during the entire classes.
c) Physical sensations to body and positive psychology both play vital roles in motivating university students to learn better in classrooms.

d) Apart from the fun nature of games as the chief motivator, the second most important reason to support games to be incorporated in classroom learning is due to the intrinsic nature that visuals and colours are more sensationally powerful than plain words, followed by learners’ desire to win their peers as the third key factor to conclude that gamification is motivating in both face-to-face and online classrooms.

e) In other words, it is obvious that traditional classrooms with teachers’ one-way lecturing and teacher-centered classrooms are no longer enough to satisfy students’ need for innovative learning as the new trend nowadays, especially with the acceleration of digital learning impacted by the outbreak of COVID.

Kapp [3] identifies gamification as “using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems”. An active learning context refers to the various learning approaches and instructional methods such as experiential learning, collaborative learning, cooperative learning, case-based, inquiry-based, problem-based, team-based and game-based learning. These different models cover the subset of active learning. As aforementioned, almost half (47.8%) of the university and college students respond they prefer both competitive and collaborative games, followed by competitive games as the second most popular type of games (26.1%), level-up category of games (18.8%), and finally collaborative games (7.2%). It is illustrated that university students have greater expectation on the variety of games that they can be exposed to during classes owing to the trend of digital learning and technological competency. Competitive games in which students compete with their fellow classmates and level-up games require players to proceed to advanced levels progressively are more popular than collaborative games comparatively. In terms of demographic background of the targeted respondents and interviewees, university and college students belong to a group of more advanced and mature learners, who are academically and mentally stronger students. Having been surviving through public examinations, they tend to be more used to a competitive learning environment and thus are relatively more self-driven to win. On the other hand, collaborative games such as games related to teamwork are regarded as less popular among these student groups. This can imply these student respondents in general may imagine their fellow classmates as academic rivals rather than teammates whom to collaborate and cooperate with. Level-up games are also popular due to the sense of achievement and accomplishment that students can attain by proceeding to another level, which can also be impacted by the prevailing level-up concept designed in video games that students are always exposed to nowadays.

Many studies have proved that friendships play a critical pivot on students’ social, emotional, and cognitive development. Liao et al. [5] finds that about 50% of students’ achievement-related comparisons are made with their best friends and they constantly compare themselves with friends. Moreover, some studies indicate that friendship relations are a key role in maintaining positive interactions among students in learning activities. Theoretically, friendships are beneficial for students to situate themselves in competitive learning environments [5]. In addition to peer bonding, studies show that gender differences can impact the preference over competitive learning. Boys are more motivated to participate in game-based learning environments than girls, who tend to have higher incentive to attain higher scores and win in competitive games than girls [5]. This means gender stereotypes exist and thus play a role in students’ learning attitudes, which correspond to the demographic background of student respondents which are represented by 72.4% males and 26.3% females in the aforementioned studies. When students are involved in an effort-demanding activity like competitions, they need to improve their learning status to win and thus are guided to realize that winning is closely correlated to the level of effort they exert. This cause-and-effect relationship is helpful for the establishment of a positive attitude towards motivational learning [5], which is enabled by competitive games in classroom learning. In other words, it is vital to take account of other variables such as English language competency and gender of learners when designing the nature and types of games to be incorporated in classrooms.

University Teachers’ Attitude Towards Gamification in Virtual English Language Classrooms in Hong Kong During Pandemic

To analyze from a more holistic view in the practice and success of gamification in university classrooms in Hong Kong during the pandemic, data from English Language teachers have also been collected for university teachers’ perspective towards the usage of games in classrooms. It is found that a majority of teacher respondents (62.5%) agree that gamification is an effective means to motivate students in universities and colleges to learn better, with 25% totally agree and 37.5% strongly agree that incorporating games in classrooms is an effective approach to motivate students to learn. In contrast, more than one-tenth (12.5%) strongly disagree that gamification is successful in motivating students while one-quarter (25%) are neutral towards gamification in both online and face-to-face classrooms (Fig. 10).
It is clearly indicated that a majority of teacher respondents (62.5%) hold the belief of the necessity of positive reinforcement towards student motivation with the use of gamification in both online and face-to-face classrooms among universities and colleges in Hong Kong. However, the comparative findings between student respondents and teacher respondents also illustrate distinctive and different perceptions and attitudes towards learning through games among the two groups. As shown from the data analysis, a majority of students (73.9%) think that incorporating games is a constructive means to help their effective learning in English Language classrooms, with the major concern whether classroom learning is fun and interesting, which constitutes more than half of student respondents’ (53.8%) need for second language acquisition. In addition, almost all students (94.2%) claim that games act as a remarkable incentive to draw their attention in classes and thus drive them to learn dependently inside and independently outside classrooms. In contrast, viewing the teachers’ attitude towards the incorporation of games in both virtual and physical classrooms, more than half of university English Language teachers (62.5%) internalize the importance of gamification and other digital teaching tools as the current and upcoming innovative trend and thus there is a need to adopt a more interactive approach for students by devising new pedagogy in relation to digital technology in order to supplement or even replace one-way lecturing in traditional classrooms. Systems that only focus on lecturing and other traditional teaching strategies produce passive learners [4]. One-way lecturing also demotivates students to learn effectively if lessons are found to be dull and boring. In general, students prefer games to be incorporated in all classrooms more than teachers, given the intrinsic nature of collaborative and competitive games as motivators to get students to work with peers, with 31.7% difference regarding the popularity of game usage between university students and teachers.

The statistics also demonstrate that all teacher respondents have the experience in running their English Language classes with games, as shown from the questionnaires that none of any individual teacher respondent claims he or she has never used games as teaching tools in university classrooms (Fig. 11). Nevertheless, it is important to note that when it comes to the practicality and frequency of the usage of games in English Language contexts, only half of them (50%) incorporate games in classes generally for a few times every semester. If there are 13–14 weeks in every semester, it is implied that only approximately 15–35% of their total class time have been devoted gamification in university classrooms. One-quarter (25%) recount that they include some elements of games in English Language courses for more than half of the semester, which means this group of teacher respondents have spent half of the class time on
incorporating games in English Language university classrooms. Meanwhile, only more than one-tenth (12.5%) design their English Language classes once every week and the other 12.5% conduct games in classrooms once every two classes.

While a vast majority of university teachers (87.5%) reckon incorporating games in classrooms of any form is constructive in helping students to learn more effectively and positively (Fig. 12), it is indicated that there is also a majority of 75% teacher respondents believe games motivate students to participate more fully in class and learn better (Fig. 13). On the contrary, 12.5% of university teachers think gamification is not effective for students to learn better while 25% regard gamification cannot motivate students. It is concluded that there are striking differences between learners and educators in universities and colleges in Hong Kong, with reference to students and teachers’ perceptions and attitudes towards the necessity and the effectiveness of gamification towards effectiveness and motivation of learning.

**University Teachers’ Perception Over the Effectiveness of Gamification in Virtual and Face-to-Face Classrooms During and Before Pandemic**

In terms of effectiveness in using games online and face-to-face, most interviewed teachers believe that student engagement is the major concern. It is easier for teachers to engage with students in face-to-face classrooms due to their physical presence in concrete settings. On the other hand, it is harder to build rapport with students when the lessons go online, making teachers’ assessment of students’ learning progress more difficult. While students can switch off cameras on Zoom in virtual classrooms, teachers can walk around in the face-to-face classrooms to establish a sense of presence. Thus, implementation of gamification becomes more inclusive for each student in face-to-face classrooms, in which both active and passive learners are more motivated by gamification in physical classrooms, making learning more direct and effective. Nonetheless, there is a possibility that gamification can exclude the passive learners in online classrooms since it is more challenging for the teachers to supervise every student online. Meanwhile, a few interviewed teachers advocate that the ease of incorporation of games in online classrooms and face-to-face classrooms
are both at a similar level. The most dominate reason that relates to the positive psychology among university students is that learners are generally attracted by the fun nature of games in lectures.

**Limitations of Gamification in Remote and Face-to-Face Classrooms**

Most of the student interviewees hold the view that there would be differences in respect to the effectiveness of game usage in online in face-to-face classrooms. Most of the students reckon that gamification is more effectively implemented in face-to-face classrooms before the pandemic rather than virtual classrooms during the pandemic in tertiary education in Hong Kong. Interestingly, it is generally believed that learning through collaborative games is more effective in face-to-face classrooms than virtual classrooms as shown from the fact that most student interviewees internalize the notion that face-to-face classrooms promote collaboration and effective communication in comparison to remote learning. Apart from collaborative games, it is also stated that competitive games online may be less fun and interesting than games in face-to-face classrooms, explained by the difficulty of online classrooms in establishing a competitive environment to encourage students to fully engage in competitions. Comparatively, face-to-face communication enables learners to interact instantly and accomplish given tasks collaboratively in an easier and more comfortable way, providing the concrete physical settings which allow spontaneous and direct communication instead of potential communication barriers in intangible virtual channels. Hence, face-to-face classrooms facilitate both collaborative and competitive games more effectively in helping and motivating students to learn better than online classrooms.

In addition, online classrooms pose a challenge for teachers to create a positive and proactive learning atmosphere and thus is more difficult to set up the mood for game playing in virtual classrooms. Furthermore, the difficulty in implementing gamification to all students in online classrooms without excluding any passive learners is a crucial hindrance for student engagement. This includes the constraint in “monitoring whether students are following house rules during online classes since some students can possibly turn off the cameras and mute themselves” according to one interviewed university teacher. One interviewed student cites an analogy that lecturers can spot out any student in physical classrooms who is not paying attention and thus the internalization that students should listen and respect the lecturers can in return facilitate students to concentrate better and reinforce students’ full participation in face-to-face classrooms. One interviewed student has internalized the idea that “online learning is dull and boring anyway” and he is always distracted at home especially when he is sitting in a comfortable private area. It is generally believed that learning becomes more proactive in face-to-face lessons. This corresponds to some interviewees who proclaim that learning through games would be more “interactive, exciting, fun and attractive” with face-to-face and direct communication since the sense of student engagement increases behaviorally and emotionally in physical classrooms. It is also said that “face-to-face classrooms can trigger more interactions between teachers and students, and among students”, according to another teacher respondent, which result in better student–teacher and student–student rapport.

On the other hand, the technological nature of virtual classrooms hinders the effectiveness of incorporation of games in digital learning experience. Among the interviewed students, it is found that they sometimes experience delay of response from teachers and classmates due to internet connection problem in remote classrooms, and thus reckon face-to-face learning to be more effective and direct.

**The Gap Between University Teachers’ Acknowledgement of Vitality of Gamification in Classrooms and Frequency of Its Usage in Practicality**

Despite that most university teachers recognize gamification as a constructive, effective and innovative means in facilitating students’ learning, only 12.5% of teacher respondents incorporate games in their English Language courses once every week and once every two classes, respectively. Likewise, none of any teacher respondents disagrees that gamification in classrooms is effective in motivating students to learn (Fig. 13). The limitations of the practicality of gaming in both online and face-to-face classrooms can be justified by numerous obstacles in adopting gamification and other digital teaching tools in university classrooms. A large majority (75%) of teacher respondents hold the view that one major hindrance in incorporating games in classrooms is the tight teaching schedules (Fig. 14). Half of them (50%) believe that there is a lack of trainings and resources received and somehow games and the content of courses are not interrelated (Fig. 14). The third most common limitation (37.5%) is that there is the limited access to different software and tools to support learning through games in classrooms (Fig. 14). The use of realia and concrete props are unlikely in virtual classrooms during the pandemic. Therefore, the implementation of gamification in online classrooms requires more institutional support, trainings to be received and know-how of the technology than that in the status quo, which further limit the feasibility and scale of game-based learning in virtual classrooms during the pandemic.
Effectiveness and Practicality of Incorporating Games Online Versus Face-to-Face Classrooms

Regarding the kinds of innovative teaching tools used in classes, most interviewed university teachers name a few including “Zoom Polling”, “Zoom Whiteboard”, “Kahoot”, “Padlet”, “Word Clouds”, “Everything Poll”, “Graph Drawing” and “Lucky Draw”. It is also highlighted that “Kahoot”, “Padlet”, “Spotify”, “Word Clouds” and “Lucky Draw” are their preferred tools in both online and face-to-face classrooms for English Language teaching in universities and colleges in Hong Kong. From the results of interviews of teacher respondents, it is revealed that university teachers who deploy the concept of gaming in classrooms are in the purpose of enhancing the level of spontaneity, interaction and participation among students in classes. With games, concepts and abstract ideas can be visualized to be comprehended more easily and effectively with the use of multi-modality like colours, symbols, graphs, shapes, videos and music through games.

Furthermore, the interviewed teachers hold the belief that games are catchy to students’ attention and teachers can make use of gamification to monitor whether students are attentive in class at that time. However, one interviewed teacher holds an opposite view by raising her concern that there is a possibility that “some students may feel harassed by the compulsory gaming in classrooms and students may also believe learning should be serious instead”. Most interviewed English Language teachers explain the usage of games in classrooms can be hindered by the fact that the application of games and other digital tools rely too much on the content of the subject knowledge at that time. At times, ideas and inspirations from games can be interrupted by the lack of originality. Besides, the unstable internet connection makes smooth adaptation of games in online classrooms during the pandemic become even more difficult.

While gaming tablets and social media have been a major part of students’ life, teachers have been facing a significant challenge towards students’ motivation and achievement inside classrooms. Learners can get easily distracted and show a loss of interest, and thus communication between students and teachers becomes remote and fragile, especially with the distancing learning during the hit of pandemic [4]. In particular, some teachers even find the digital platforms discouraging, as they have to do extra work to adjust the pace of classes to achieve a better understanding of the content. This requires enormous effort both inside and outside the classrooms to integrate the digital content into lesson plans. Intensification of educational adaptations to be made in classrooms is necessary to promote students’ proactiveness in content learning, making learning experience comprehensive and meaningful. Another disadvantage pointed out is linked to the negative attitude of some students towards these digital challenges, since not all students prefer to play an active role in classrooms [4]. In fact, some of them feel more comfortable to take notes during classes and study after classes without using mobile phones for academic purposes because they fear making mistakes in public when using this digital resource or not feeling supported by their peers when being asked about content previously worked on in public [4]. Further research and information on the application of these innovative proposals is, therefore, needed to better understand and adapt these ludic strategies to the main interests and demands of students in higher education.

Conclusion and Limitations

This research compares and evaluates the success of gamification and effectiveness of various digital teaching and learning tools used to motivate students in university classrooms in Hong Kong during and before the pandemic. It also explores the possibility and limitations of applying the notion of gamification in virtual classrooms. The research concludes that gamification in classroom learning has been an unavoidable trend in tertiary education in Hong Kong. With data collected from both learners and educators towards English Language learning, future research can be
extended to compare the data analysis from both pre- and post-tests, with the integration of different games for experiments into the teaching process to assess the level of students’ active participation and motivation towards a more interactive and stimulating environment. It is also recommended that more resources, trainings and technical support should be offered by the authorities and educational institutions to pursue sustainable game-based learning and provide a more engaging and interactive environment for learners in the new technological era.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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