Don't Make the Player, Make the Game: Exploring the Potential of Gamification in IS Education

Complete Research Papers

Grace Kenny
Irish Centre for Cloud Computing and Commerce (IC4),
Dublin City University,
grace.kenny@dcu.ie

Roisin Lyons
Dublin City University,
roisin.lyons@dcu.ie

Theo Lynn
Dublin City University,
theo.lynn@dcu.ie

Abstract

Gamification is a pedagogical technique for enriching the student experience. It has been positioned as a solution to the challenges facing IS education such as student engagement, learning, and retention. However, existing applications of gamification in education focus on the role of game elements in enhancing lower order learning goals such as understanding and remembering, solely considering students as consumers of gamification. This study explores how student-led and student generated gamification projects can improve learning at all cognitive levels on Bloom's Taxonomy of Learning. It also aims to study gamification self-efficacy as an important outcome of such projects. Preliminary findings offer tentative support for the potential of student-led gamification projects in enhancing learning and developing gamification self-efficacy. These findings will be explored further in subsequent analyses. This study makes empirical and practical contributions by supporting the potential of gamification and offering insights on the incorporation of gamification in IS education.

Keywords

Gamification, education, gamification self-efficacy, Bloom's taxonomy of learning, pedagogy.

Introduction

IS courses aim to equip undergraduate and postgraduate students with the business and technology knowledge and skills necessary to succeed in the age of digital innovation (Fichman et al. 2014; Freeman and Freeman, 2013). However, there are many challenges facing educators at present including low student retention levels, undergraduate students' struggle with self-directed learning, low levels of student engagement, motivation and learning (Osatuyi et al. 2016; Angelika et al. 2015; Filippou et al. 2014). Gamification is the utilization of game elements to engage individuals, motivate behavior and solve problems (Kapp, 2012). It presents a unique opportunity for educators to address challenges of student motivation and engagement (Angelika et al. 2015; Filippou et al. 2014), while also rejuvenating IS pedagogical approaches (Osatuyi et al. 2016; Freeman and Freeman, 2013). The many calls for the incorporation of gamification in education has led to the emergence of some interesting applications of gamification in IS courses (Osatuyi et al. 2016; Paspallis 2014). Yet there is a considerable lack of knowledge of the best approaches of 'gamifying' learning, or how to empirically measure or study the efficacy of gamification in achieving the behavioral outcomes it promises (Hamari et al. 2014).

Past studies incorporating gamification into the curriculum have done so using elements of edu-tech (Freeman and Freeman 2013). These pedagogical approaches integrate aspects such as quiz applications

which test students' knowledge (e.g. Codish and Ravid, 2014) or game elements in an app to encourage participation (e.g. Paspallis 2014). This study aims to move beyond the common inclusion of game-based elements into the course content towards a more robust constructivist student self-led gamification method. Specifically, as part of a Digital Innovation, Creativity and Enterprise module, students are introduced to gamification as an emerging trend and taught about the gamification experience, and its potential to the business, management and IS industries. Subsequently, the undergraduate students utilize this knowledge to develop their own gamified solutions and gamification experiences. Instead of letting the students use gamification, the goal is to teach them to create their own mechanisms for effective content delivery; to develop *game makers* not *game players*. The study explores a number of key research domains and draws from IS, education and management education to create its key research objectives. Firstly, the study will examine the effect of student-led gamification on student learning. Secondly, the study will study and test a gamification self-efficacy construct within the student population. Lastly, the efficacy of varying instructor and student-led gamification pedagogies will be explored in terms of their effect on student engagement and performance.

The paper proceeds with a brief overview of gamification and research on the role of gamification in education and IS education. Literature is drawn from a number of key research areas including education theory, IS education, gamification and student engagement and efficacy. The methodology is outlined and the preliminary findings are discussed. The paper concludes with an overview of the next steps in this research.

Literature Review

Current Status of Gamification

Due to the nascence of gamification, there are many competing descriptions of the phenomenon. Combining these views, Buckley (2015) describes gamification as the use of game elements and psychological prompts to encourage desired behaviours among specific user groups such as customers, employees or students. As a relatively new topic, organizations are only beginning to explore the potential of gamification for learning, development, and customer engagement (Kankanhalli et al. 2012). The potential of gamification to influence behavior (Buckley, 2015) has spurred interest among organizations, practitioners and researchers alike. Indeed, a recent Gartner report predicted that gamification will drastically influence innovation, personal development, customer engagement, and employee learning (Burke, 2014). Despite the potential of gamification, the phenomenon is not widely studied or understood (Monu and Ralph, 2016). Furthermore, many organizations currently fail to successfully leverage gamification (Burke, 2014). In order to realize the potential of gamification, there is a need for context-specific research which seeks to provide empirical evidence on the benefits, challenges, and impacts of gamification (Buckley, 2015). As much of the existing work focuses on organizational contexts (El Masri and Tahini, 2015), there is a need to explore the potential of gamification in the context of education.

Gamification in Education

Researchers are slowly beginning to explore the potential of gamification in education, however limited research and understanding exist (Kankanhalli et al. 2012). Many authors call for the inclusion of gamification in education as traditional learning approaches can fail to engage students (Cheong, Filippou, and Cheong, 2013). Rather than the didactic 'chalk and talk' mode of delivery, allowing students to access and progress through content in a gamified immersive manner may lead to higher levels of self-directed engagement. Such pedagogical approaches can stimulate deeper learning as the student has the autonomy to choose the content and pace themselves (Pennington and O'Neil, 1994). Existing research provides many interesting examples of the application of gamification in education, some of which are illustrated in table 1 below. In addition to outlining how gamification can be incorporated in the learning environment, these studies support the potential of gamification as a method for improving student motivation and engagement (Angelika et al. 2015), and a method for improving student enjoyment (Filippou et al., 2014).

Authors	Sample	Gamification	Aim
Monu and Ralph (2016)	22 Undergraduate Statistics Students	Statistics Game (Control): simple quiz game Pico Data Mart(Treatment): narrated game	Experiments to compare students' knowledge in both groups
Paspallis (2014)	High School Students	Treasure Hunt app with game elements to improve enjoyment	Motivate students to take an interest in coding
Cheong et al. (2013)	Undergraduate IT Students	Quick Quiz web application used in tutorials	Explored student's opinions about effectiveness of Quick Quiz in enhancing learning

Table 1. Applications of Gamification in Education

Despite these findings, several gaps and weaknesses are evident in existing gamification studies. For example, in their archival analysis of gamification research published in top IS journals and conferences between 2008-2015, Day and Ede (2016) note that many existing studies fail to incorporate gamification into specific hypotheses formulation. The authors also call for further empirical research which explores the impact of gamification elements. Following their review of the literature, Hamari et al. (2014) highlighted several issues including small sample sizes, poorly designed instruments, mixed findings and inadequate analysis. They called for future research to address these weaknesses. This study aims to overcome some of these weaknesses when exploring the potential of student-led gamification.

IS Education

The need to transform IS courses has been highlighted recently by Fichman et al. (2014) who assert that IS students require in-depth understanding of information technology and innovation in order to make an impact in today's technology-driven world. This transformation should incorporate both new technologies and tools to move away from traditional lecture based teaching (El Masri and Tahini, 2015) while also enabling a self-directed learning experience for students (Freeman and Freeman, 2013). It can be argued that gamification has the potential to transform and improve IS education (Osatuyi et al. 2016). In the practical sense, gamification is an important tool for students to master to enable them to address the skills gap hindering industry-wide gamification efforts at present (Burke, 2014). The relevance of gamification to IS education in the broader sense is apparent as all gamification implementations will involve the development of an IS (Codish and Ravid, 2014). There is a need to incorporate gamification on a deeper level, solving real-life IS problems using gamification tools and elements (Freeman and Freeman 2013). This study explores how student-led gamification projects can improve learning at all cognitive levels, using Bloom's Taxonomy of Learning as the focal framework. It also aims to study gamification self-efficacy as an important outcome of such student projects.

Study Context

The sample is a cohort of students of what is referred to as the DICE module in a University in Ireland. DICE (Digital Innovation, Creativity and Enterprise) is a first year module in its sixth year of operation which annually has over 400 students from the faculties of business and enterprise computing. Students are taught aspects relating to entrepreneurship, management and digital innovation through lectures, team work, online learning, live webinars, project work and mini-conferences with speakers and attendees from the wider business community. While gamification is fast becoming an effective way of engaging students in content and classes, in this module the experience is 'flipped', where students create their own gamified experiences. During the module, students were taught about the benefits of using gamification in certain contexts such as training and market research. A number of seminars (online and offline) were provided which examined various gamification strategies and techniques such as onboarding and

progression. In addition, aspects of gamification such as progression bars and leader boards were incorporated into the student LMS platform (Moodle/Loop). In the applied project, student teams were allocated group topics which they had to conceptualize into an online gamified experience and pitch this concept online via their team blog. Some examples included a pirate-themed adventure game which teaches users about the intricacies of a feasibility study; 'Mission to Launch' a multi-level game which assists early stage entrepreneurs; 'HRM-Ville' and 'The only way is Ethics'. The project allowed student teams to develop their knowledge of the topic, learn focused digital and communication skills, and engage with gamification principles in a higher-order manner. The projects were graded in terms of their 1) Innovation/Creativity, 2) Depth of Idea/Consideration, 3) Feasibility of Idea, 4) Discussion, 5) Layout/Structure, 6) Design of pitch/blog, 7) Justification and target market analysis, 8) Background knowledge, 9) Complexity and 10) Effectiveness of any tangible/created gamification elements.

Proposed Approach

This paper reports on the initial findings from a larger project. As such, the paper focuses on the first two research aims and explores whether gamification can improve student learning through all levels of Bloom's taxonomy and whether student-led gamification can foster the development of gamification self-efficacy. In line with these aims, the model outlined in figure 1 is proposed. Each construct is briefly explained in this section along with the hypothesized relationship with gamification self-efficacy.

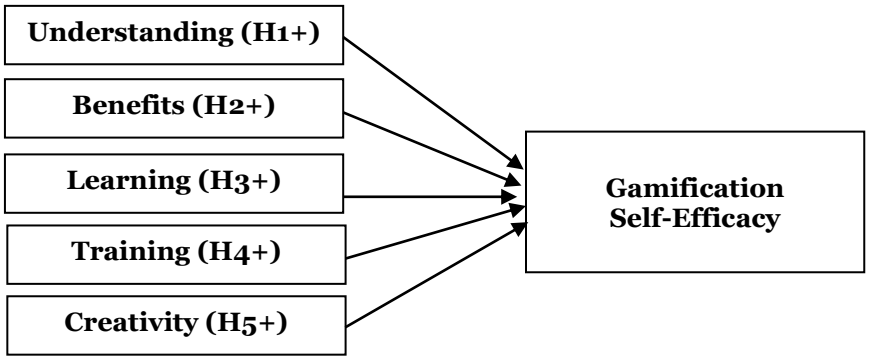

Figure 1. Proposed Model

Gamification Self-Efficacy: General self-efficacy is defined by Bandura (1977, p. 240) as 'a judgement of one's ability to execute a particular behavior pattern'. It is suggested that a person's self-efficacy will determine their level of intended effort, persistence and engagement with a project. Embedded in social cognitive theory, all efficacy constructs are future-orientated perceptions about one's ability to execute a specific course of action in order to produce a given achievement in a certain setting or context (Goddart, Hoy and Hoy, 2004). Bandura (1986) postulated four main sources of self-efficacy; mastery experience (hands-on), vicarious experience (observational), social persuasion (from others), and psychological/emotional states (from within). As a contextualized version of the self-efficacy construct, we propose that gamification self-efficacy (GSE), like self-efficacy is grounded in the socio-cognitive approach as it is cognizant of the individual agent and the environment which can be made up of offline and online elements. Gamification self-efficacy is considered a judgement of one's ability to execute behaviors relating to both the use and the production of gamified elements. In essence, it reflects a deeper level of intended execution as it asks the individual to determine their perceived competence as both a user and creator (or player and maker). In this study, we seek to develop students' gamification self-efficacy through student-led gamification projects.

Understanding refers to students' broad understanding of gamification measured mid-way through the module. While many previous studies have not provided students with training in gamification (e.g. Cheong Filippou, and Cheong, 2013), this study provided many methods of training as outlined in the previous section. It is argued that these teaching methods will arm students with a basic understanding of gamification. It is posited that a broad understanding of gamification will positively impact students'

gamification self-efficacy. Conversely, if students believe they currently lack an understanding of gamification, they will be less confident in their ability to use and apply gamification.

H1. Understanding will positively influence Gamification Self-Efficacy.

Benefits: Previous studies show that students express positive views towards the benefits of gamification in education (Cheong, Filippou, and Cheong 2013). However, the influence of these perceived benefits on other factors has not yet been explored. This relates to the assertion of Day and Ede (2016) who noted that few studies have offered hypotheses on the role of gamification and the call made by Hamari et al. (2014) for studies which engage in empirical testing of relationships related to gamification. We posit that such positive views towards the inclusion of gamification will also foster confidence in one's own ability to utilize gamification in the future in educational and other contexts.

H2. Perceived Benefits will positively influence Gamification Self-Efficacy.

Learning in this study refers to students' perceived learning across all levels of Bloom's taxonomy of learning. In education, gamification aims to promote learning behaviors which enhance the cognitive capacities of students (Osatuyi et al. 2016). It is thus necessary to move beyond basic uses of gamification which target the lower-order elements of learning (remembering, understanding). Instead gamification has the potential to reach higher levels of student learning by allowing students to apply content (experimentation, synthesis, application). Bloom's Revised Taxonomy is a hierarchical six-level classification system that uses observed student behaviour to infer the level of cognitive achievement (Athanassiou et al. 2003). As an application closely based on the original Bloom's Taxonomy (Bloom, 1956), the emphasis in the revised model is on "planning curriculum, instruction, assessment, and the alignment of these three" (Anderson and Krathwohl, 2001, p. 263). Of particular relevance to the study herein was the addition of a 'creation' dimension beyond evaluation in their reconceptualization. The revision by Anderson and Krathworthl (2001) maps 6 cognitive processes onto a hierarchically specific set of knowledge levels which moves from lower order thinking and cognition to levels of deep higher order thinking: remembering, understanding, applying, analyzing, evaluating, and creating. Researchers have also used Bloom's taxonomy as an assessment tool to evaluate student performance in traditional courses versus online and experiential methods (Halawi and Pires, 2009), and it has been noted as a potentially useful tool for student self-assessment of learning experiences (Athanassiou et al. 2003). Bloom's Taxonomy has also been noted as a key tool in the promotion of experiential learning (Cannon and Feinstein, 2005). We propose that student-led gamification projects can enhance learning across all levels of Bloom's hierarchy. If students believe they have achieved deep levels of learning throughout this course, they are more likely to express confidence in their future ability to utilize and develop gamification. It is thus hypothesized:

H3. Learning will positively influence Gamification Self-Efficacy

Training: As outlined in the previous section, students were trained in gamification using many methods. It is argued that this training provided students with basic knowledge needed to develop their own gamified solutions. Students' perception of how this training supported them in their projects is likely to influence their perceived readiness for using gamification going forward. It is posited that if students believe this training provided sufficient support, they will feel more confident in their ability to use gamification. This is explored in the following hypothesis:

H4. Perceived Training Support will positively influence Gamification Self-Efficacy.

Creativity: Individual factors are likely to influence students' experience with gamification and their gamification self-efficacy as a result. Due to the focus of the study context on digital innovation and the creative nature of gamification, individuals' perceived creativity is of particular interest. It can be argued that individuals who perceive themselves as creative will be more confident in their ability to utilize gamification in the future. This is investigated in the following hypothesis:

H5. Individual Creativity will positively influence Gamification Self-Efficacy.

Methodology

These relationships were tested using individual student survey data collected from the DICE module. This survey was disseminated at the mid-point of the yearlong module after students' applied projects

were completed (but before results were disseminated). Students were encouraged to take this survey during class but were informed that participation was optional and in no way related to their grading. The surveys were published using 'Survey Monkey' and sent to the sample via email invitation. The survey included several control variables such as prior knowledge of gamification, gaming experience, degree programme, and individual factors such as gender. Existing measures were utilized and adapted where possible. Gamification self-efficacy was measured using 8 items adapted from the computer self-efficacy instrument developed by Compeau and Higgins (1995). Understanding (UND) was measured across 5 items related to broad understanding of gamification. Perceived benefits (BEN) were measured using 4 items which captured students' perception of the benefits associated with gamification in education. To explore Bloom's taxonomy of learning (LER), 12 items were utilized to measure students' perception of learning across each level (2 items representing each level) following prior studies which have sought to measure Bloom's taxonomy (Halawi et al., 2009). Individual creativity (CRE) explores individuals' self-perceptions of creativity based on the scale measure by George and Zhou (2001). This was thereafter adapted by Janssen and Xu (2008). For the purposes of our examination, the measure was shortened and amended so that individuals could self-report on their own perceptions of self. The scale consisted of thirteen items with a five-point Likert scale.

Preliminary Findings

A total of 264 complete responses have been received. After removing all responses that failed the attention trap, a total of 208 responses remained for analysis. Approximately 56% of the sample were male and 44% were female. The majority of respondents were aged 18 (31%) and 19 (55%), with the remainder aged 20-32. In terms of prior gaming experience, 16% of students stated they never played games and a further 35% stated they rarely played games. A further 30% stated they played games occasionally, 13% played games often, while 4% played extremely often. With regards to previous knowledge of gamification, the majority of students stated that prior to the module, they were not at all aware of gamification (33%) or were slightly aware (40%). The data was cleaned and screened for linearity, homoscedasticity and multicollinearity (Hair et al., 2010). The reliability of all constructs was tested using the Cronbach Alpha in SPSS. All constructs were deemed reliable with Cronbach scores of above .70 (GSE: .806; UND: .905; BEN: .914; LER: .936; CRE: .876). In line with the first aim of the study, students' perceptions of how useful the inclusion of gamification in education were explored. Students were asked to rate the usefulness of gamification in education to aid with learning across the six levels of Bloom's taxonomy using a 7-point Likert scale ranging from Not at All Useful to Extremely Useful. Table 2 below provides an overview of students' perceptions across all items in the Learning scale. As shown below, large majorities of students believed that gamification was highly useful to aid in learning at all levels of Blooms Taxonomy.

Level	Item	Low Usefulness (Scores 1-3)	Neutral (Scores 4)	Highly Usefulness (Scores 5-7)
Remembering	Remember New Concepts	7.7%	16.3%	76%
	Knowledge of facts and concepts	7.7%	17.3%	75%
Understanding	Understanding New Concepts	10.6%	13.9%	75.5%
	Understanding and Explaining Concepts	9.6%	16.8%	73.6%
Applying	Applying Knowledge in an engaging way	3.8%	19.2%	77%
	Applying gamification to new concepts	8.2%	19.2%	72.6%
Analyzing	Examining scenarios more clearly	9.1%	19.2%	71.7%
	Analyzing how concepts can be gamified	7.7%	22.6%	69.7%
Evaluating	Evaluating concepts more clearly	11.5%	16.3%	72.2%
	Evaluating gamification platforms	9.6%	22.6%	67.8%
Creating	Using gamification to complete tasks	3.8%	18.3%	77.9%
	Design a gamified experience	9.1%	19.2%	71.7%

Table 2. Bloom's Taxonomy Responses

To explore the second aim of this research and to test the hypothesized relationships, linear regression was conducted in SPSS. Several control variables were included such as gender, course, programme, gaming experience and pre-gamification awareness. Gamification self-efficacy was the dependent variable

and 5 independent variables representing the hypotheses above were included. The model summary is outlined below in Table 3. As illustrated below, the independent variables explained 53.2% of the variance in gamification self-efficacy. We calculated the *F* statistic which was significant to the <. 001 level.

Model	R	R ²	Adj. R²	*SE* of the Estimate	*Change Statistics*			
					R² Change	F Change	dfs	Sig. F Change
2	.746[b]	.556	.532	.348	.484	40.790	5, 187	.000

b. Predictors: (Constant), Gaming Experience, Programme, Pre-Gamification Awareness, Gender, UND, CRE, Training, LER, BEN

Table 3. Model Summary

The coefficients and confidence intervals are depicted below in Table 4 along with the VIF scores. As all VIF values are below 3, it can be concluded that multicollinearity is not an issue with the data (Gaskin, 2012). As shown in the table below, understanding of gamification has a significant positive influence on gamification self-efficacy thus supporting H1 (β=.125 P< .05). Perceived benefits of learning gamification also has a positive, significant influence on gamification self-efficacy thereby providing support for H2 (β= .163 P< .05). The relationship between learning and gamification self-efficacy is also highly significant thus H3 is strongly supported (β= .472 P< .01). Perceived Training support does not significantly influence self-efficacy. Therefore, H4 is rejected (β= -.003 P = .962). Lastly, individual creativity has a slightly significant influence (β= .109 p = .053) on gamification self-efficacy, thus offering tentative support for H5.

Model 2	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	*SE*	β	*t*	*P*	Tolerance	VIF
(Constant)	1.265	.280		4.523	.000		
Gender	.061	.055	.059	1.095	.275	.812	1.231
Module	-.219	.113	-.097	-1.929	.055	.945	1.059
Programme	-.006	.005	-.059	-1.163	.246	.921	1.086
Pre-Gamification Awareness	.030	.027	.056	1.090	.277	.898	1.114
Gaming Experience	.038	.026	.080	1.485	.139	.809	1.236
Training	-.001	.025	-.003	-.048	.962	.568	1.762
Learning (LER)	.281	.041	.472	6.804	.000	.492	2.031
Benefits (BEN)	.064	.028	.163	2.258	.025	.455	2.200
Understanding (UND)	.069	.032	.125	2.137	.034	.691	1.447
Creativity (CRE)	.105	.054	.109	1.945	.053	.763	1.311

a. Dependent Variable: GSE

Table 4. Coefficients

Discussion

IS education currently faces challenges such as low student retention, motivation, and engagement (Osatuyi et al. 2016; Angelika et al. 2015; Filippou et al. 2014). Gamification is often heralded as a solution to these challenges as it can facilitate experiential learning through the simulation of real environments and problems (El Masri and Tahini 2015; Freeman and Freeman, 2013). Despite recent advancements, education at the university level is yet to be successfully gamified (El Masri and Tahini 2015). This study

explores the potential of student-led gamification in IS education with two aims. First, the study seeks to explore how student-led gamification can enhance learning. The paper answers the call for research which investigates how gamification can be implemented in education in ways which improve learning on the higher levels of Bloom's Taxonomy of learning (Codish and Ravid, 2014). Second, the study explores how this approach can develop gamification self-efficacy among students. Data collection is currently underway. Thus, this paper provides some preliminary analysis and findings. With regards to the first aim of the study, large majorities of students believe that the inclusion of gamification is useful for learning across all levels of Bloom's taxonomy. This study represents the first effort to leverage gamification as a technique in helping students examine, evaluate, and create gamification projects, thus improving their practical skills in gamification and equipping them with a tool for learning other important IS concepts and topics. In this preliminary stage of analysis, support was provided for 4 of the 5 hypothesized relationships. These findings indicate that gamification self-efficacy can be developed through enhanced learning across all levels of Bloom's Taxonomy, a broad understanding of gamification (developed through various teaching methods), and understanding of the benefits of gamification. Individual creativity also strengthens GSE, thus suggesting that individual factors may impact one's confidence in using gamification in the future. The proposed model explained 53% of variance in gamification self-efficacy thus indicating that student-led gamification projects can foster the development of confidence in one's ability to use and create gamified solutions in the future. The next steps in the study will involve testing the hypothesized relationships using SMARTPLS to provide deeper, more robust insights. The third aim of the research will also be explored by testing the influence of these independent variables and GSE on students' performance.

It is envisioned that this study will make a number of contributions to the literature. Firstly, the study aims to address many of the weaknesses inherent in existing gamification studies by engaging in hypotheses development and testing, developing robust measures, and conducting robust thorough quantitative analyses (Day and Ede, 2016; Hamari et al. 2014). The study also conceptualizes and works towards operationalizing gamification self-efficacy as a construct which can be retested and applied in other contexts. From a theoretical perspective, the study seeks to provide further support for the efficacy of experiential learning in developing students' knowledge and skills and improving student performance. In terms of education, we are currently seeing a slow shift in IS education from a lecture-based approach to an experiential learning approach (El Masri and Tahini, 2015). Fichman et al. (2014) positions digital innovation as a fundamental and powerful concept (FPC) in IS education. We propose that gamification has the potential to also act as an FPC in IS courses, as gamification can also be utilized to explain or think through a broad range of problems, situations, and topics relevant to IS. The preliminary findings illustrate students' positive views towards the usefulness of gamification as a tool for learning and the influence of our student-led approach in developing gamification self-efficacy. The latter stages of this study will attempt to evaluate the role of student-led gamification further to provide recommendations for its inclusion in IS courses and broader business education applications. Lastly, the study also has broader practical contributions. By equipping students with an understanding of gamification and providing them with experience in applying this knowledge, IS graduates can develop the gamification skills which many organizations lack at present (Burke, 2015).

Conclusion

Gamification presents many opportunities for learning and development in organizational and educational contexts. However, in order to realize this potential, there is a distinct need for research which provides meaningful, actionable insights to guide future gamification implementations. This study makes initial steps towards the gamification of university education by moving beyond the current ways in which gamification is applied to a course. We argue that a student-led gamification approach can enhance students' learning across all levels of Bloom's taxonomy and foster strong gamification self-efficacy among students. Our preliminary findings illustrate strong student support for the inclusion of gamification, and show that gamification self-efficacy is strengthened by enhanced learning, understanding, benefits, and individual creativity. The next steps of this research will follow two streams. Firstly, the existing model will be extended to investigate the influence of gamification self-efficacy on students' performance in this digital innovation module. The second stream will explore gamification self-efficacy further as a multidimensional construct, comprised of both understanding of gamification techniques and technical skills to exploit gamification. This stream of research will eventually culminate in the further

development, testing and validation of the gamification self-efficacy construct and provide practical recommendations on incorporating student-led gamification efforts into business programmes and courses.

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