Gamified Learning: A rationale for ludo-pedagogy and gamified classrooms

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Abstract

This paper examines the value of ludo-pedagogy and gamified teaching and learning in a contemporary context and introduces strategies that can be adopted to enable a gamified classroom. In particular, this paper outlines the framework for creating a workshop-style 'escape room' which foregrounds core elements of ludo-pedagogy and gamified classrooms and moves beyond documented cases that feature more simplistic methodologies. Gamified teaching and learning has been proven to help students achieve higher order learning outcomes and increase student self-perception, and the primary aims of this paper are to outline potential approaches and to encourage further development.

Introduction

Video game play is one of the fastest growing forms of multimedia entertainment in the world, and many adolescents play games for multiple hours each day. Gentile (2009) conducted a large national study in the United States and found that 88% of young people aged 8 to 18 years play video games and the average amount of time spent playing video games per week is 13.2 hours. Despite their popularity, much of the research examining game use from the fields of developmental and social psychology have focussed mainly on the association with negative behaviours such as aggression and addictive behaviour (Anderson et al., 2010; Bushman and Gibson, 2011). This rather technologically deterministic approach, coupled with the limited research on positive outcomes, often in relation to modes of cathartic behaviour, is surprising considering the importance that should be placed on understanding how learners interact with games and what place games have in learners' everyday lives.

Ludic play

Since the 1960s, the term 'ludic' has been applied to playful behaviour and playfulness and is often used within the context of gaming (Raessens, 2010). Gaming is a significant cultural phenomenon, which moves beyond the stereotyped notion of hardcore gamers (Ask, 2016), recognising that smart technologies and the internet have helped to construct a 'ludic age' (Zimmerman, 2015), and generate playful identities (Raessens, 2006). The ludification of culture perceives games as a formative experience much in the same way literature, film and television were for previous generations (Raessens, 2006). Ask (2016) recognises that play and games are not new, but renewed interest and re-evaluation has now become important. While the notion of gameplay certainly precedes digital gaming, and there is much precedent for the pedagogical application of a range of non-digital platforms and mediums such as board games and trading cards, this paper acknowledges that contemporary students are immersed in a digital ludic culture and, that this context can be applied to and integrated within teaching and learning approaches. Explicitly, skills that contemporary students associate with gameplay can be utilised in the classroom, improving their motivation leading to them achieving higher learning outcomes. This paper proposes a rationale for gamified learning, which serves to domesticate games somewhat, drawing from students' everyday life and making the classroom an extension of that experience.

Gamification is relatively new to pedagogy, although 'the use of game design elements in non-game contexts' (Deterding at al., 2011, p.11) to improve processes is not a new idea. Landers (2015) argues that gamification

involves augmenting a pre-existing system, such as the classroom, with game elements, and that the gamification of learning specifically includes game elements such as, but not limited to challenge, environment, game fiction, human interaction, immersion, and rules or goals which facilitate learning outcomes. This approach moves beyond simple approval with badge rewards, or achieving levels and competitive components as discussed by Denny (2013) and Hamari et al. (2014). Instead the specific use of serious (serious games are defined by Michael and Chen (2005, p.17) as 'a game in which education (in its various forms) is the primary goal, rather than entertainment') or commercial games is the goal. This paper identifies how the gamification of learning might work practically and specifically through proposed teaching and learning strategies that address some of the game elements outlined by Landers (2015), which can be manipulated through, and converge within, gamified classrooms and student-centred ludo-pedagogy.

Of relevance is the distinction between games and play: a common way to distinguish these related terms is to describe gaming as activities with defined rules and goals, whereas play has more freedom (Ask, 2016). Against this context, the gamified classroom is defined by a set of rules, usually scaffolded by the teacher, which leads to the achievement of learning objectives or goals. The gamified classroom is also a 'flipped' classroom: a student-centred, not teacher-centred process, providing opportunities for the performance of specific tasks that require propositional and functioning knowledge in order to achieve higher order learning outcomes (Eaton, 2017), thus involving more freedom and being more playful, whilst also requiring hard work. This paper proposes the gamified classroom as a ludo-pedagogical approach because students are required to play, rather than just consume, to produce meaning, knowledge and artefacts. Achieving learning outcomes as a result of this ludo-pedagogy requires more than just navigating through the steps of the game or 'playing by the rules' of a traditional learning environment, thus encouraging creative and productive engagement with the learning process itself as well as the associated content. This engagement with the learning process is crucial to the development of deep learning skills introduced by Marton and Säljö (1976) where students participate in a degree of self-directed education, an agency which is mobilised by participation in the gamified classroom. Furthermore, ludo-pedagogical strategies move past deep learning to 'deep active learning' as described by Matsushita, with emphasis on internalisation and externalisation, or the acquisition of knowledge and the higher-order thinking that makes use of this knowledge (2018).

Connectivism

Connectivism is a learning theory proposed by Siemens (2014) that seeks to explain how students learn within the context of the digital, hyperlinked age, which is rapidly changing and networked. Siemens (2014) proposes that learning should occur though connections, where learners recognise and interpret patterns within diverse networks, whilst also growing personal networks. Research by Harper (2015) discusses the 'synapticism' of contemporary digital culture and ascribes to this phenomenon the value of encouraging non-linear thinking. Synaptic processes evidenced in contemporary gaming culture provide networked experiences which allow reciprocal connections or junctions between participants. This paper contends that non-linear ludo-pedagogic approaches to learning opportunities allow for similar degrees of interconnectivity. That is to say they appreciate the process of connecting information sources, the facilitation of continual learning and decision-making as integral parts of the learning process, whilst also recognising that millennial students' learning particularly, has been impacted by technology as the first generation of digital natives (Buckley et al., 2017).

It is widely accepted that media activities and technologies can contribute to the development of cognitive skills useful for educational attainment (Fiorini and Keane, 2014) and that computer use specifically can foster verbal and non-verbal intelligence (Fiorini, 2010; Malamud and Pop-Eleches, 2011; Beuermann et al., 2013). A video game is a problem-solving task that requires planning, collecting and synthesising information and actions thus it improves abstract reasoning, pattern recognition and spatial logic (Suziedelyte, 2015). Johnson (2005) argues that these abilities chime with what has been defined as fluid

intelligence (Cattell, 1971), involving both inductive and deductive reasoning, suggesting video gaming is therefore more cognitively challenging and interactive than television watching and most computer activities. Whilst it is argued that watching television can be interactive, it does not direct specific cognitive challenges, rather it mediates incidental learning experiences (Coates Nee and Dozier, 2015). Suziedelyte's research (2015) showed that game playing positively affects 3-18-year-old children's problem-solving ability, which suggests that game playing students have the potential to achieve higher order learning outcomes. Ventura et al. (2013) speculate that continual exposure to these types of challenges might also lead to greater persistence over time.

Instead of learning every new skill from the beginning, when game playing new skills are acquired 'on demand' (Gee, 2008) and when players are most motivated to learn them, encouraging them to persist when they face adversity. Adolescents have reported that their motivation stems from exciting and challenging game content (Olson et al., 2008), being forced to adapt to new challenges and modify game play strategically in order to overcome these. This 'learning by doing', or experiential method, has also proven successful with mature students who, in research by Leask (2009) and Pillay and James (2013), through the use of games were able to develop their self-awareness, collaborative working and decision making skills. Adachi and Willoughby (2012) note that video gaming mirrors organised activities such as participating in sporting teams as it involves intrinsic motivation, concentration and cognitive effort and cumulative effort over time to achieve a goal. In addition, they suggest that these characteristics elicit initiative.

If, as Adachi and Willoughby (2012) suggest video gaming can increase initiative, then it would seem appropriate to embed similar gamified characteristics into the learning environment in order to increase student motivation and engagement, which is a well-documented struggle for lecturers (Buckley et al., 2017). The shift in consumption of media signalled by digital technology must be reflected in the tools and approaches adopted in contemporary pedagogy. As Clark et al. (2015) propose, scholarly and pedagogical fields such as creative writing, which have enjoyed a hitherto unequivocal association with print culture and print media are, in recent years, beginning to acknowledge the importance of challenging hesitancy over the inclusion of elements of e-literature and digital creative writing. There is much potential to utilise gaming elements to provide students across a wide range of disciplines with learning opportunities that they are more familiar and proficient with, creating a gamified learning environment. There has been some research into the potential of gamified learning environments, where a commercial video game was employed as a teaching method (Loras, 2017). The study revealed that this approach has the potential to alter students' own self-perception as it recognises and assigns value to students' interest in gaming. Using gamified concepts and behaviours that are familiar to students outside of the classroom creates a safe and familiar environment, where they feel they can develop their identities without judgement (Loras, 2017). This positive self-perception is significant because it often affects students' expected achievement and behaviour, and as a result can increase their sense of responsibility for their own learning (Skaalvik and Skaalvik, 1996).

Games and play in the Learning Environment

In light of this context and the evident value of games and play, it is useful to consider how university lecturers might address what appears to be a justifiable need for game elements and play within their classrooms. The intention of this investigation is not to propose that all learning environments should work to embed actual video games whether serious or commercial, into their pedagogical approach in order to be gamified. Rather, this paper discusses how gaming elements such as problem solving, creative collaboration and active participation, may be used to create a ludic approach embedded within the pedagogy to encourage students to play within the learning space. This approach would demand that students use their initiative to navigate learning tasks and take ownership of their own

development and achievement. This has been attempted by course leaders at Indiana University (Tay, 2010) and Nicholson (2013) at Syracuse University, but only to the extent of students progressing through levels and / or achieving points or badges, which seems to under-estimate the potential of a truly gamified classroom. Buckley et al. (2017) deployed a gamified approach for their research, yet this centred on reward, feedback, and competition, whilst over-looking the potential benefits of collaborative and creative strategies.

Loras (2017) suggests a model for the creation of successful gamified learning environments for the psychological and educational benefits of learners that operates on three levels. Firstly, a game-playing pedagogical approach to learning tasks which motivates students and encourages self-worth. Secondly, at classroom level, the role of the teacher in designing and facilitating whilst encouraging students to utilise skills and knowledge acquired prior to and as part of the learning process. Thirdly, incorporating the students' view of themselves, from within the wider context of gamified culture to domesticate games in the educational context, attributing value to playful elements and, thus, potentially changing students' self-perception as learners. This model suggests that gamification could have a potentially powerful effect on group dynamics, where through teacher-designed gamified learning activities, students are empowered to utilise skills acquired through commercial gaming. In order to navigate the gamified classroom, students must use their own initiative and become responsible for their own learning by way of the flipped classroom approach, as discussed earlier. The potential of the gamified classroom is that it attributes value to games and play, and augments contemporary theories which privilege 'serious play' (Morley, 2007) or the play of learning through experimentation; the freedom to express and consider ideas within the ludo-pedagogic space. Students thus draw on a formative cultural framework, which is important for self-perception, resulting in increased motivation and engagement. Although this is a useful model, the research once again does not provide specific ludo-pedagogical strategies beyond that of employing a commercial game within the classroom, which seems somewhat one-dimensional and unsophisticated.

Ludo-pedagogical Strategies

This paper proposes a rationale that might enable the convergence of ludo-pedagogical strategies within the gamified classroom, to achieve higher order learning outcomes and increase student self-perception. That rationale being for a workshop-style 'escape room'. Escape rooms are 'live-action team-based games where players discover clues, solve puzzles, and accomplish tasks in one or more rooms in order to accomplish a specific goal (usually escaping from the room) in a limited amount of time' (Nicholson, 2015). Escape rooms have existed as a form of entertainment since 2007 (Mayer et al., 2016). These experiences involve participants being introduced to the room and provided with a simple framework of rules, including a time limit and the number of clues available, in order to solve the puzzle and 'escape', or 'complete' the room. Escape rooms present cooperative challenges that take place in the physical world; players must be active, and must work with each other directly (Nicholson, 2018). As a discreet and time-sensitive event the escape room provides an apt site for ludo-pedagogy. By placing a time limit on the gamified experience a clear durational space is established for creative play. The immersion of the experience is thus structured, and the learning experience is clearly signposted by timings, which 'whilst practical in nature, also allude to the contract into which you are entering, the exclusive and ludic society which you agree to join' (Machon, 2013 p.96).

This paper proposes that the student-centred, flipped classroom, mirrors the characteristics of an 'escape room', as it demands active participation and collaboration amongst students in order to acquire facts and accumulate knowledge before making connections and synthesising this information. This process leads to creative thinking, as students must work together to create an artefact that evidences both prior and newly acquired acknowledge in order to 'complete' the room. Overall, the proposed framework outlines a gamified learning experience that integrates and engages students through complex cognitive tasks and self-organisation, also reflecting the core principles of connectivism

(Siemens, 2014) and the value of non-linear thinking (Harper, 2015), to achieve higher order learning outcomes.

It is possible for teachers to facilitate the escape room by crafting virtual and physical items, or clues which creatively establish the puzzle and fact-finding narrative. The learning narrative may be structured around a particular literary, cultural, or historical movement, genre, or creative form. Preparation of this ludo-narrative may include, but is not limited to: printed-out contemporary secondary sources, for example a journal article from the 1970s which might provide valuable contextual information, without revealing the purpose of the document; images or photographs of key thinkers or innovators posted on the wall, without revealing autobiographical details or significance; codes, cyphers or anagrams which reveal the links to relevant *YouTube* videos; quizzes which are structured to provide contextual clues in addition to testing general or subject-specific knowledge, role-play where the teacher, seemingly not involved in the 'game' is completing a task that once the significance is recognised and understood, reveals vital information for the 'puzzle'; the unexpected 'hot-seating' of other members of staff, not previously known to students, who may have significant personal experience helping to draw connections between facts.

The puzzles or clues deployed by the teacher would creatively support the 'story' to be discovered and control the pace of the game, ensuring that students acquire skills as well as knowledge, co-operation and creative thinking for example, without this being perceived as onerous or unachievable. Students would be engaged in practical, learn-by-doing activities in order to progress through the game, achieving higher order learning outcomes when facts and new concepts have to be applied. This participatory storytelling, where students make choices with implications (Nicholson, 2018), demands that students work collaboratively to reveal and realise the social aspects and the relationship between information, in order to synthesise the data. For example, students may make intertextual associations as a way of decoding contextual significance; or, complete writing tasks designed to encourage individual and collaborative composition in order to meet specific parameters or satisfy predetermined objectives.

Students would use the information collected and the skills acquired to create an artefact of their choosing, one that represented the synthesis of skills and knowledge, and which demonstrated their creative engagement with the process. This could be a visual timeline, a PowerPoint presentation or a piece of creative writing, for example. The process of content making fosters a greater awareness of the referentiality of source material, be it literal or symbolic. These higher order skills are facilitated by encountering and participating in a connected experience predicated on an established network or system of networks, dictated to by non-linear thinking. This could help to legitimise collaborative working whilst giving students agency. It might also mean that game-play would formalise as group rules and dynamic would have to be negotiated in order to complete the next higher order learning objective. It also demonstrates the potential for changes in perception as game-play in this sense would be highly valuable, being used to create something that all students can benefit from: the artefact created would serve to capture the outcomes of the teaching and learning session, being the resource that students would need for assessment preparation.

The co-operation and interaction required at this point in the 'game' might ensure that students play for meaning, not just passive gaming. Open and collaborative practice has been clearly identified as an important factor in learning the processes necessary for productive content creation (Kearns, 2009; Webb and Melrose, 2015; Sewell, 2014). This aspect of cooperation encouraged within the framework of the pedagogical experience helps to substantiate a more diverse set of learning outcomes as well as providing a platform for assessment as discussed. The customisation of activities would suggest that students take responsibility for their own learning, and that they might be empowered to do so as a result of completing previous playful tasks within the gamified classroom. This elucidates how the escape room might increase their initiative, motivation and self-

worth, thus advancing their self-perception. This combination of techniques would demonstrate the value of gaming, empowering students to draw on their lived experience of ludic culture. This range of ludo-pedagogical activities would appeal to different students with different learning styles -- students would naturally be drawn to, or perform better at different parts of the game, which again would force collaboration, whilst also building skills in cognitive domains not so analogous to their preferred style.

Escape rooms, with their spasmodic and non-linear learning narrative, illustrate the potential to draw together ludo-pedagogy and gamified classrooms by confronting students with a form of struggle or conflict. This strategy avoids reductive didactic pedagogical approaches, which de-motivate and dis-engage students (Buckley et al., 2017), and instead mirrors the games that they enjoy outside of the classroom. Students complete playful learning tasks purposefully, but also in their own time, in their own order and at their own will creating immersive and memorable experiences which cannot be replicated in the standard classroom (Nicholson, 2018; Sobocinski, 2017) and which emphasise deep learning outcomes rather than surface level absorption of content. This strategy mimics students' experience of ludic culture, which informs their identity and experience of the world. As with familiar experiences of gaming from within ludic culture, students benefit from the correspondence between gameplay and interactive narratives, in this case the 'narrative' of the educational material delivered. The proximity of this correspondence or, as Pynenburg argues, the 'ludonarrative harmony' (Pynenburg, 2012) drives and augments the value of the experience by immersing participants. Through immersing themselves in the ludic experience, students are excited and empowered within the classroom, raising their self-esteem, which may further improve attainment. Sobocinski (2017) notes that gamified pedagogical approaches can only be designed and facilitated by experienced teachers, require a testing process of two terms and demand daily and weekly attention, thus equating to approximately two -- three times more hours of work than 'normal' course preparations. However, this substantial increase in workload might be mediated if we also consider how traditional structures might be amended to account for such innovative approaches, for example writing new curriculum with the help of students or with teaching assistants as partners. We might also consider how gamified approaches can be integrated on a micro scale in the first instance. Fundamentally, any form of gamification should remain invisible to students, in that they may 'see' the narrative and have fun, that is they develop new pathways and habits to achieve learning goals, but to stay motivated to achieve higher learning outcomes, the core learning objectives must stay in the background. One of the most challenging and time-consuming demands of gamification is accounting for the different personalities and different motivations of students (Chou, 2015) and thus an excess of allied solutions, in order to engage as many students as possible, must be considered and facilitated within the game. Although this may seem labour-intensive, these types of preparations can enable teachers to be more flexible, innovative and radical in their approach.

The social and educative value of the kind of active and emancipated participation and co-creatorship encouraged by ludo-pedagogic strategies such as that which has been outlined in this paper, has clear theoretical precedent in the work of a number of key scholars and philosophers of education (Freire, 1968; Rancière, 1987). Landers (2015) notes that there is a need for more research to better understand the processes of gamification and its potential to improve learning, arguing that without a theoretical model specific approaches to the gamification of learning outcomes and its potential would be misleading. Given the pace of developing trends in media production and consumption there is a further and pressing need to address the gap in research and establish a theoretical model that defines specific approaches to ludo-pedagogy and gamified classrooms. This model must explore the distinction between the two, whilst also proposing their complimentary and potentially symbiotic relationship.

Future Research Goal

The strategy proposed in this paper identifies what can be considered the core elements of ludo-pedagogy and gamified classrooms that extend the gamification of

learning beyond the concepts associated with previous research literatures such as serious games and game elements such as badges, points, or levels. For ludo-pedagogy: student-led interactive, collaborative play that comprises participation and engagement with both problem solving and customisable, creative tasks in order to achieve higher order learning outcomes. For gamified classrooms: teacher-led identification of the class rules and goals that build on prior skills and knowledge whilst simultaneously acquiring new skills and knowledge, through puzzles and narratives created by the teacher. The next research goal would be to adopt and test these attributes individually and in meaningful combinations through strategies such as the one outlined in this paper. In doing so, researchers might evaluate their impact more accurately, assessing whether students' self-perception can be altered positively, by mobilising their initiative, motivation and perseverance. Researchers might also investigate whether the strategy outlined does draw on students' experiences of ludic culture, adding value to, and justifying the gamification of learning. The strategy projected in this paper could be tested and evidenced within 'live' classroom sessions through both qualitative and quantitative research methodologies.

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