

## EXPRESSION OF ENGAGEMENT IN GAMIFIED STUDY COURSE

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### Abstract

**Purpose** – To explore expression forms of engagement during gamified study course.

**Design/methodology/approach** – The qualitative study was being conducted in order to find out how engagement is being expressed among the students in university during one semester of gamified study course. The data were collected in two group interviews and one set of individual interviews. Interviews were conducted after second, third, and fifth month of the semester. Data were analyzed using thematic qualitative analysis approach.

**Finding** – Study has shown that engagement in gamified study subject manifested itself in long term and short term forms of expression. Data analysis have shown that engagement is expressed in six forms: participation, rush, flow, emotional engagement, cognitive engagement, and agentic engagement. It is different from motivation that was influenced by three factors: extrinsic rewards, intrinsic satisfaction, and lack of motivation.

**Research limitations/implications** – The results of this study have shown that engagement is context sensitive. Since the research is done in exploratory nature the conclusions cannot be generalized. Ability to feel engaged is strongly dependent from personal characteristics of a student. Moreover, the external factors like relationships among group members as well as role of an educator might have significant result on student engagement in gamified study subject.

Research results allow to connect two concepts of engagement. In educational sciences engagement is understood as a long term phenomenon while in game studies it is explained as temporal experience. Applying gamification in university study subject allows to explore what temporal features of engagement does transfer to long term engagement. Research results are also significant in trying to find consensus between two competing approaches towards engagement phenomenon in educational sciences and game studies.

**Practical implications** – By revealing how engagement is being experienced in gamified study subject it is possible to better understand how different gamification techniques and mechanics lead to motivational outcomes. Also, not all forms of engagement might be desirable in educational context. The results of the study allows broader understanding about the functioning of gamification mechanics which could lead to improved gamified systems used for educational purposes.

**Originality/Value** – The study takes an original approach in exploring expression of engagement in two overlapping disciplines - educational sciences and game studies. There are very few studies which use qualitative methods for deeper understanding of engagement in gamified learning environments.

**Keywords:** engagement, gamification, gamified study course, gamified learning environment

**Research type:** research paper

## Introduction

Gamification has become a buzzword in academic and business circles not long after the term was introduced back in 2008 (Walz & Deterding, 2015). Even though elements of game design were used before gamification has become a trendy topic (Nacke & Deterding, 2017), the interest in gamification increased after business organizations and marketers began to incorporate gameful design principles in their services. During this period practitioners like Zichermann & Cunningham (2011) or Werbach & Hunter (2012) suggested that gamification could revolutionize how people interact with business services or educational products. On the other hand, critics of the method argued that it is targeted to exploit users and is focused on short-term behavioristic goals which contribute little to none to gameful experiences (Bogost, 2011a; 2011b; Klabbers, 2018). Despite the ongoing debate about the goals and extent of gamification, researchers from various domains began to explore gameful design effectiveness in practice. However, the idea that application of game elements in the activities which are not directly related to games affect motivation and engagement had more of a wishful thinking approach rather than robust scientific evidence. Literature meta-studies revealed that there is no consensus among the academics about the effectiveness of gamification (Hamari, Koivisto, & Sarsa, 2014; Dicheva, Dichev, Agre, & Angelova, 2015). Majority of the studies explore gamification effectiveness in the field of education. However dissonance in methodological standards and lack of clear definitions what is considered as an outcome of gamification leaves this field of research fragmented. The study of Seaborn & Fels (2015) revealed that in educational context gamification is mostly associated with the alteration of engagement. However, in many instances engagement is used as self-explanatory term without further elaboration on the concept. Gamification is closely related to game studies (Landers, Auer, Collmus, & Armstrong, 2018) but researchers analyze it mostly in educational setting. Whitton & Moseley (2014) claim that understanding of engagement in games and education is different in „potentially conflicting, ways“. This means that concept of engagement should not be trivialized and needs to be investigated further especially in interdisciplinary domains.

Engagement in game studies is associated with temporal, intrinsically driven experiences (Boyle, Connolly, Hainey, & Boyle, 2012; Martey, et al., 2014). In education it is explained as phenomenon oriented towards long-term goals (Fredricks, Blumenfeld, & Paris, 2004; Reeve & Tseng, 2011). It is not known, however, what forms of engagement are being expressed when gamification is being applied in educational setting, thus creating a scientific *problem* for this study. Expression forms of engagement is considered as an *object* of this research. The *objective* is to explore how engagement is being expressed during the gamified study course. The *research question* is: What forms of engagement does the students experience during the gamified study course? The research results contributes to better understanding of engagement and its transformations when two study domains are being integrated. From the practical point of view study helps designers and developers to better understand how motivational affordances in gamification shape the ways of engagement expression.

## Definition of gamification

Gamification is rooted in video games but the scope and goals of this method are still being debated (Landers, Auer, Collmus, & Armstrong, 2018). Some authors claim that gamification is closer to marketing endeavors and workplace productivity practices applied before the term gained wide recognition (Nelson, 2012; Seaborn & Fels, 2015). In practical gamification literature Zichermann & Cunningham (2011) focuses on psychological affection of game-like mechanics. However, their proposed gamification elements are strongly oriented towards extrinsic stimuli and may not necessary lead to gameful experiences (Bogost, 2011a). Werbach & Hunter (2012) definition of gamification is close to Deterding et al. (2011) and is oriented towards business frame. Authors argue that gamification is focused on extrinsically motivated experiences that make feedback systems more engaging. Kapp (2012) claims that “game-based mechanics, aesthetics, and game thinking” are at the core of gamified system engagement. In academic literature researchers argue that games and gamification could be detached by analyzing the purpose and amount of game mechanics elements used in the game-like systems. Deterding, Dixon, Khaled, & Nacke, (2011) define gamification as the “use of game design elements in non-game contexts”. Based on this definition gamification embodies some elements similar to games but fall beyond the scope of game design itself. Authors deconstruct gamification into *gamefulness* (lived gameful experiences), *gameful interactions* (elements and contexts that summon these experiences), and *gameful design* (practice of constructing gameful experiences). Hamari, Koivisto, & Sarsa, (2014) argue that definition by Deterding et al. does not specify which psychological outcomes are inherent to games and which ones belong to gamification, thus making it hard to circumscribe the scope of gamification. Houtari & Hamari (2012) propose that gamification should be defined as a „process of enhancing services with (motivational) affordances in order to invoke gameful experiences and further behavioral outcomes”. Current gamification research discourse leans towards merged approach where elements of game mechanics are as important as psychological and behavioral outcomes. Seaborn & Fels (2015) summarize most popular definitions of gamification and propose their version of it claiming that gamification could be defined as “the intentional use of game elements for a gameful experience of non-game tasks and contexts”. For the purpose of this paper, Seaborn & Fels definition will be used as a basis for qualitative study.

## Notions of engagement

### *Engagement in education*

Although there is no singular definition of engagement, researchers agree that it is a multidimensional construct (Boyle, Connolly, Hainey, & Boyle, 2012). Educational sciences and game studies have different approaches towards engagement (Whitton & Moseley, 2014). In educational context this phenomenon is explained as continuous process while in game studies it embodies instant experiences. One of the most popular approaches state that engagement consists of behavioral, cognitive, and emotional dimensions (Jimerson, Campos, & Grief, 2003; Fredricks, Blumenfeld, &

Paris, 2004; Hoffman & Nadelson, 2010). Reeve & Tseng (2011) add agentic engagement expressed as contribution to learning activities. Whitton & Moseley (2014) analyze how conceptions of engagement can be merged together when analyzing them from educational and game studies perspectives. According to authors engagement could be divided to superficial and deep dimensions. Superficial engagement consists of participation and attention. Deep engagement embodies captivation, passion, affiliation, and incorporation. Hamari, et al., (2016) describe engagement as construct consistent of concentration, interest, and enjoyment. Filsecker & Kerres (2014) propose to call engagement “volitional process”.

Literature review reveals that in those cases when game or game-gased learning environment are being investigated, engagement has a tendency to be expressed through related concepts. However, the same affections or experiences can be named differently thus making it difficult to perform consistent analysis of the construct (Sharek & Wiebe, 2014). In some cases such concepts as flow, motivation, or immersion are used as synonyms to engagement (Annetta, Minogue, Holmes, & Cheng, 2009; Nelson 2016). In educational contexts motivation is considered to be closest to engagement (Reeve, 2012). Researchers agree that engagement has some externally observable elements that arise from behavioral characteristics of an individual. It is also agreed that deeper forms of engagement are hard to track. The relationship between engagement and related forms of affection is not well established and the lines between these concepts are obscured due to lack of scientific evidence.

### ***Engagement in games and gamification***

Engagement definitions in games are overlapping with other concepts like motivation, immersion, or flow. Game researchers are more interested in temporal experiences that could be described as unique forms of engagement that could be interpreted as close but separate construct defined as an outcome, precursor, or state of engagement. According to Schoenau-Fog (2011) engagement in games can be „explained as a process whereby players engage in a pursuit of intrinsic or extrinsic objectives and consequently perform a range of activities in order to accomplish objectives and feel affect“. O'Brien & Toms (2008) deconstruct engagement through dimensions of „challenge, aesthetic and sensory appeal, feedback, novelty, interactivity, perceived control and time, awareness, motivation, interest, and affect“. Martey, et al. (2014) used multiple engagement measurement methods in case of digital game and came up to a conclusion that engagement is being experienced in many different ways but the correlations between those measures were limited.

Motivation is one of the most popular concepts to be used in game oriented scientific research altogether with engagement (Przybylski, Rigby, & Ryan, 2010; Rigby & Ryan, 2011; Fuster, Chamarro, Carbonell, & Vallerand, 2014). Evidence show that these two concepts are closely related and in many cases overlap. Studies focused on games usually deconstruct motivation, or refer to motivational theories (Garris, Ahlers, & Driskell, 2002; Klimmt & Hartmann, 2006; Liu & Chu, 2010) However, motivation is considered as a broader concept that integrates short term engagement through which it can be observed (Reeve 2012).

The concept of flow, explored by Csikszentmihalyi (1990; 1997; Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005) is also very common in game related literature (see

Harmat, et al., 2015; Kiili, de Freitas, Arnab, & Lainema, 2012; Procci, Singer, Levy, & Bowers, 2012; Nacke & Lindley, 2010). As an optimal experience flow requires adequate challenge and skills, purpose, and feedback (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005). Literature review suggests that flow could be described not only as optimal experience, but also as optimal form of engagement. Because of its gratifying nature and vast amounts of scientific studies supporting its expression, theory of flow is widely applicable in various domains.

Immersion – the last concept that is most commonly used together with engagement in game studies. This term is usually met in publications that focus on overall atmosphere and narrative of interactive media (Bormann & Greitemeyer, 2015). Immersion is also one of the least explored forms of engagement. This concept could be defined as spectrum of psychological experiences related with engagement to fictional environments, absorbing attention and personal perception system (Lombard & Ditton, 1997; Murray, 1997). Some authors interpret these forms of affection as parallel but representing different outcomes of same kind of activities (Douglas & Hargadon, 2000). Others – consider engagement as a subset of immersion (Brown & Cairns, 2004; Nilsson, Nordahl, & Serafin, 2016). Yee (2006) holds immersion as a part of motivation. Ermi & Mäyrä (2005) and Nilsson, Nordahl, & Serafin (2016) state that immersion itself has multiple dimensions. Literature review reveals that the nature of immersion is still being debated. In some instances (see Jennett, et al., 2008) immersion definition is close to one of flow. Hamari, et al., (2016) goes even further by claiming that immersion can be described as characterization of flow experiences more focused on learning and related emotions. However, studies analyzing immersion does not always reproduce the same outcomes and this could be explained through insufficient understanding of the construct.

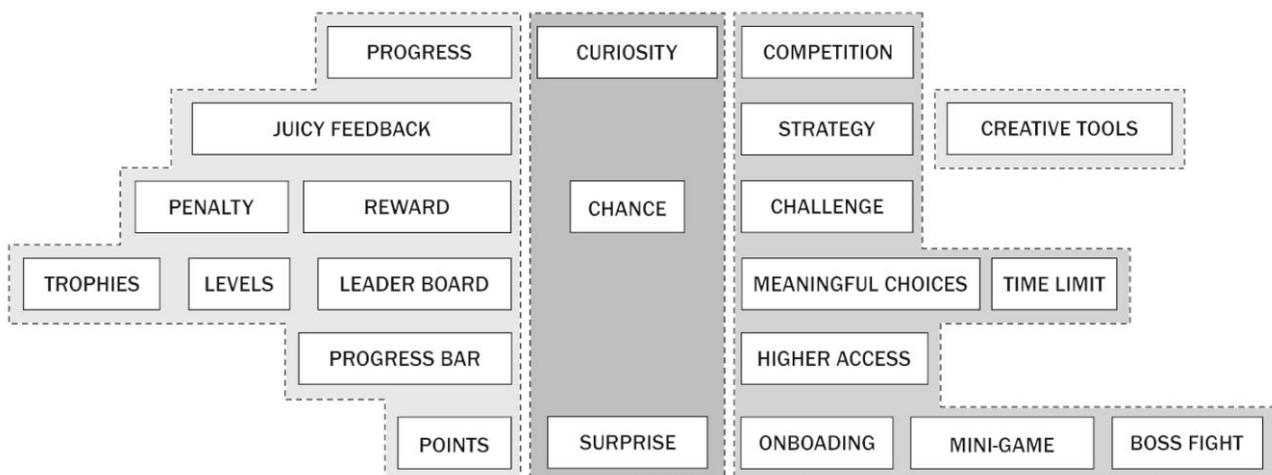
Studies on gamification have a tendency to use term “engagement” without specifying its multidimensional nature (Fitz-Walter, Tjondronegoro, & Wyeth, 2011; O'Donovan, Gain, & Marais, 2013; Vaibhav & Gupta, 2014; Dicheva, Irwin, Dichev, & Talasila, 2014; Hamzah, Ali, Saman, Yusoff, & Yacob, 2015; Leaning, 2015; Chang & Wei, 2016; Tan & Hew, 2016). In majority of publications authors focus more on *how* and *where* gamification is applied without deeper dwelling into dimensions of engagement. It is also common to address motivation as a synonym to engagement. Flow is more commonly met in publications with better scientific groundings to the theory (Huotari & Hamari, 2012; Sillaots, 2014; Shi, Cristea, Hadzidedic, & Dervishalidovic, 2014; Kalinauskas, 2014; Hamari, 2017). Immersion, however, is explained in rare cases (Döpker, Brockmann, Stieglitz, & Horbach, 2013) and is generally used as a self-explanatory concept. For the purpose of this paper engagement will be considered as inclusive phenomenon that might express itself in various temporal or long-time forms.

### **Gamified study course**

In this section of the paper gamified study course will be presented as the basis for the qualitative study. There are two main terms (gamified system, and gamified environment) that will be used in order to separate computer-based system from broader gamified activities. Gamified system could be defined as computer-based electronic study environment where game design elements are used to foster

engagement during educational activities. Gamified study environment is a broader application area for gamification where educational instructions fall beyond gamified system but the outcomes of educational process are compatible with the gamified progression metrics. The gamified system was created based on Alevin, Myers, Easterday, & Ogan (2010) proposed “framework for the analysis and design of educational games”. System framework consists of learning objectives, MDA framework by Hunicke, LeBlanc, & Zubek (2004), and instructional design principles. Even though Alevin, et al. use this framework for creation of educational game, its’ main characteristics were suitable for gamified system as well. The learning objectives were defined by using Bloom’s Revised Taxonomy (Anderson, Krathwohl, Airasian, Cruickshank, Mayer, & Pintrich, 2001). Based on MDA framework main mechanics and aesthetical outcomes were defined. Finally, instructional design principles were formulated as follows: a) progression by scaffolding, b) autonomy, c) honest competition, d) relevance of content and form. The gamified system was created based on these principles in order to maintain coherency of the main aim and to restore the balance if some of the system users would demonstrate undesirable forms of agency.

Mechanics for the gamified system were refined based on lens of intrinsic skill atoms method, proposed by Deterding (2015). Based on this framework mechanics were interpreted as questions that led to refinement of motivational affordances, each different in its conceptualization level (see figure 1). Each upper category of the mechanics represented the motivational affordance that was embodied through lower level mechanics. The highest level motivational affordances were embedded into instructional design principles.



**Figure 1. Hierarchy of mechanics elements used in gamified system**

In gamified system students had access to mandatory and optional assignments. Each of them were evaluated by points. As the topic of the course went further the amount of points that were accessible to the students rose higher as well. Point system was related to levels and leaderboard. Students with higher levels had higher access to special tasks. However, they were separated from lower level activities in order to avoid repetitive point farming. As the level progressed tasks became more abstract and required more creative input. Gamified system had integrated achievements that were used as alternative form of aesthetical feedback about the progress in the system. However, achievements were only partially connected with levels. Sometimes

achievement badges were given for certain forms of agency or as a warning for unwanted behavior. Gamified course had two “boss levels” which represented control test and the final exam. Some tasks were given by course administrator (educator), outside of gamified system. The results of these interactions were also included into progression metrics.

There were 15 levels to achieve and 45 badges to collect. Levels were associated with avatars as well as certain privileges that helped to create additional challenges for those who progressed faster. Each student had their individual progress bars with accumulated points. An additional progress bar reflected the upcoming tasks as well as missed or skipped educational activities. At the beginning of the course students were awarded small amounts of points for behavioral activities. However, later in the semester the values of points for these behaviors were reduced to zero in order to shift the focus from extrinsic to intrinsic motivators achieved through more abstract and challenging tasks. Gamified course took one semester (5 months) to complete.

### **Research design**

The qualitative study was conducted in order to investigate what forms of engagement do the students experience during the gamified study course. Qualitative research design allowed to explore engagement expression when two scientific domains (educational sciences and game studies) were being merged together. Since scientific publications in this area are scarce, qualitative approach was chosen in order to reveal possible engagement manifestations on a specific case. Research data were gathered by applying general interview guide approach (Patton, 2002; Turner III, 2010; Johnson & Christensen, 2017). During the data collection period two group interviews and one set of individual interviews were conducted. First group interview was organized during the second month of semester, when informants were familiar with gamified course but their progress level did not exceed 50%. There were seven students participating in first group interview. Informants were selected based on random sampling method (Creswell, 2012) in order to represent the population. There were 25 course members (21 female, 4 male) with average age of 21. Second group interview was conducted after third month of the semester, when the students finished first boss level and reached around 70% of overall progress. During this interview eight informants were present. They were selected based on purposeful sampling method (Creswell, *ibid.*). The criteria for the selection was based on their forms of agency in gamified study environment. Excessive or unusual behaviors (exceptional performance, cheating, focusing on specific activities) were the main criteria for being included in second group interview. Third set of interviews was conducted after the completion of the course at 5<sup>th</sup> month of the semester. However, this time interviews were conducted individually. This approach was taken in order to avoid data distortion due to power relations in a group (Johnson & Christensen, *ibid.*). Purposeful sampling method was applied with the aim to question those students who reached 13<sup>th</sup> or higher level, and those who were below level 12. Four student from the first group as well as six students from second group agreed to participate in final stage of the interviewing session.

Thematic analysis approach was used as main approach of refining scientific evidence (Bazeley, 2013). Thematic analysis is used for “systematically identifying,

organizing, and offering insight into patterns of meaning (themes) across a data set” (Braun, Clarke, & Terry, 2012). During thematic analysis initial and axial coding was used in order to deconstruct data and later define the relations between codes (Liamputtong, 2009). Before the first stage of the analysis transcribed interviews were repeatedly re-read several times. Notes and memos about the emerging patterns were taken and later became subject material for data analysis. During the first run of coding outstanding segments of the texts were selected with emphasis on experiences, perceptions, contexts, and attitudes towards gamified course. After the first run there were 173 original codes produced. As suggested by Bazeley (ibid.), analytic memos were given to codes that were potentially forming a pattern in order to secure important information for alternative coding stages after the deconstruction of data. In the next stage codes were grouped and regrouped based on their links defined in the first stage of coding. There were 52 codes left after the second iteration of coding. In the third stage codes were grouped in 29 basic themes that later were merged into 9 organizing themes. Considering the research question one global theme was refined that had 2 organizing themes consisting of 10 basic themes.

## Findings

The informants describes that the expression of engagement is constituted by 3 motivational factors (extrinsic rewards, intrinsic satisfaction, lack of motivation) and 6 forms of engagement expression (participation, rush, flow, emotional engagement, cognitive engagement, and agentic engagement).

### *Motivational factors*

**Extrinsic rewards.** Study revealed that extrinsic rewards (e.g. badges, levels, and points) were considered as additional stimuli that led to participation in gamified activities. Leveling system was highlighted as the most extrinsically rewarding. Levels were perceived as the biggest motivational factor to participate in gamified activities by some interviewees since it allowed to “avoid” control tasks and exam that were defined as “risky” and “hard to predict”. The uncertainty of the final result motivated some student to choose repetitive behavioral strategies that provided minimal amounts of points. Those students who were mostly oriented towards this goal claimed to have little attention for visuals, badges, or leader-board. Also, extrinsic rewards were perceived as long-term strategic goals, valued through the lens of future benefit. Informants described their reasoning as follows:

*I was tempted by the possibility to level up fast and to avoid an exam. I need to reach this level! I need to somehow get away from all these control tests and exams.*  
[Zelda]

*The main reason why I participated in this course is the chance to avoid control tasks if my level was high enough. If I know that the result is worth pursuing this motivates me. All the visuals, badges, and leaderboards does not bother me that much.*  
[Regina]

Badges were defined as additional form of external reward mostly associated with instant satisfaction and aesthetical admiration. However the value of badges was perceived differently, depending on the outcome that a badge is suited to produce. If achievement signaled a simple completion of a task it was perceived as less valuable compared to those badges that granted certain privileges. Interviewees associated badges with the specific type of feedback that allowed “to feel safer from the uncertainty of the exam”.

**Intrinsic satisfaction.** Intrinsic motives were also present but not so literally expressed during the interview sessions. Informants strongly emphasized on value of “learning something new” since it is related with “purpose of studying in the university”, an ability “to grow”. Qualitative data analysis revealed that even those students who were mostly focused on extrinsic rewards, later in the course felt the intrinsic satisfaction that was situated by the sense of intellectual progression.

*I did the tasks because of points. And attended the classes for the same reason. But later I found that other meaning. In the things I've learned. [Regina]*

*During the workshops you realize that what we play, what we apply in our projects, we learnt it during the course. This is what we learned for, this is why we struggled. [Alma]*

Intrinsic satisfaction is related to volitional choice to be a part of gamified environment by “following the rules of the game”. The need and ability to be a part of the study process arise from the personal value system. It is reinforced by engrossing study content and personal determination to keep progressing even when the challenge was high. With the help of supporting feedback system embedded in gamified environment students were encouraged to perform better. But they made decisions autonomously, based on their inner needs and values. The source of intrinsic satisfaction was resulted by their self-determined performance and the relevance of the study material. According to informants, the tasks were “interesting”, “capturing”, and “innovative”. Importance of the study content is also related with the purpose of the studies in university. One of the informants stated that:

*It is important to be familiar with the learning material, because you are studying in higher education institution. It is not enough just to listen through and to get the diploma. There's more than that. [Cortana]*

**Lack of motivation.** Interview data revealed that pursuit of extrinsic rewards led to fatigue. The sense of “being tired” and “apathetic” were common to all participants of the gamified course and were especially vividly expressed after the first control tasks (3<sup>rd</sup> month of the semester). Most students stated that after boss levels the determination for work dropped dramatically. According to informants they “almost wanted nothing and did nothing”. Even those participants who were interested in routine point gathering reported decreased motivation and “didn't want to do anything”. Gamified system had variety of optional activities as well as various visual elements being integrated within the main study material. While the novelty of the course was a powerful driver to engage, when it wore off – students stopped responding to an external stimuli. According to one of the students:

*There's just too much of everything. Gamification within the course looked fresh and new. It was interesting to see what's next. But now we are just overwhelmed by everything. [Eliza]*

Differences in characters, attitudes and values also led to decreased motivation. According to some informants, during the group work few students were unable to “contribute to the common goal”, because they “just didn’t care”. Conflicting situations in group projects also played a part in lack of motivation. This was especially noticeable among the students who preferred individualistic approach to work. For them needing to communicate and search for the compromises seemed “annoying” and “frustrating”. Some of the students claimed that poor group relationship dynamics lead them to “desperation and apathy”.

“Extremely high challenge” was named as one of the demotivating factors among course participants. It led to “frustration” that later was expressed through distancing from educational activities. Low self-confidence as well as unwillingness or inability to reach required objectives was the reason why some of the students backed down from optional activities first. Those tasks that were perceived as “repetitive”, were also ignored or done “for the sake of progress bar”. Repetitiveness also contributed to the loss of novelty. Finally, unclear or insufficient feedback was considered as an obstacle for being motivated:

*I just pressed a button and then got the question. Then I pressed the button again and everything disappeared. I failed the task! I didn't get the essence of the game. There was no direct feedback or assistance. I got so angry! I couldn't understand what I was doing wrong. [Aria]*

### ***Forms of engagement***

**Participation.** The long-term engagement is expressed through basic theme of participation. It arises from continuous activities performed during the study process. Participation is a combination of lecture attendance and a long run performance in gamified study environment. Qualitative data analysis revealed that those students who defined themselves as “engaged” were active in wider spectrum of academic activities, not only those where gamification was applied. Participation is also associated with willingness to contribute to study process. Informants claimed that they were “actively trying to attend the lectures” and to “complete most of the optional tasks”. Participation was associated with general sensation of “being within the course”. Some students associated it with academic environment, a necessity to “keep up with the standards” of what it means to be studying in the university. Others were more focused on relationships with group members and cooperation with academic staff. Long-term participation was associated with the content quality of the course. In comparison to traditional material of other lectures, informants claimed that working with gamified study content was “a little bit more fun”. Lectures and readings seemed less “bleak and boring” and that kept students “closer to the information”. Gamification elements together with interesting content of the course reformed the long term habits of some students. Two of the interviewees noted that:

*If gamification elements would not be present I really doubt that I would log-in so often. I'm very attracted by them. It probably changed my learning habits. My presence in gamified study system is more frequent than on Facebook. That surprised me a lot. [Mario]*

*At first my participation was average. But somewhere around the middle I was so hooked! I wanted do more, to progress faster. I can't even explain why. You just wanted it. [Tali]*

**Rush.** This form of engagement is associated with fast emotional reaction towards game-like features of the gamified system. Research participant claimed that at certain moments they wanted to “accelerate the progression” and were “hooked” on the point gathering. In most of the cases rush was experienced during behavioral tasks that were reflected in the progress bar. Interviewees claimed that during the rush they felt the “obsession” with the activity and compared it to “gambling”. This form of engagement is unconscious, fueled by zest and adrenalin, oriented towards itself. In some instances it could be compare to the flow state but rush is less related with the optimal experience of happiness, though it does require a challenge. Informants claim that rush affection is “triggered by competition”. It is not always perceived as pleasurable experience because informats feel that they “lost control of the situation”. One of the participants explained the rush affection while working on one of gamified task:

*I loved to reach for higher levels. I was very interested in the process of doing it. I was captured by the feeling to act now and there. I couldn't control myself, I was deeply emotionally engaged. I desperately wanted to win, to reach the higher rank. [Alessa]*

**Flow.** In this research the basic theme of flow was constructed based on interview material that revealed the highest peaks of engagement. Research data show that flow is temporal experience that is being expressed as deep form of engagement. Informants who talked about their optimal experiences elaborated on “being within of what you do”. The activities seemed “light and fluid”. It was also compared to “euphoric feeling” that resulted in “joy” and “gratification”. The experience of flow was compared to “total disconnection from the world” and is accompanied by wish “to know more”. This state also shifts the overall perception of a person as one feels that the activities require much “less effort” to be completed. The experience of flow is also identified as being “higher quality” than just regular interest. It is described as affection that comes “from the other side”. Informants reported that being in the flow distorted their perception of time. Also, the focus on the activity is significantly increased. Interviewees report that:

*It's the feeling of being engaged and concentrated towards particular issue. No one can distract you from it. You're so into it and seek more. The passage of time was barely noticeable. With gamification the time just flew. I felt happy and passionate at what I'm doing. [Samara]*

Flow is associated with positive emotions, happiness, pleasure, and gratification. Informants claimed that they felt no “external pressure” to act. This form of engagement was related to ability to overcome the challenge. Although some educational activities were considered as “tough”, ability to cope with them was pleasurable and allowed to “feel enjoyment”.

**Emotional engagement.** The participants of the research revealed that engagement is directly associated with spectrum of emotional experiences that define engagement causes and results. One of the most commonly mentioned experiences was the “sense of novelty”. Novelty is understood as the feature of gamified system that is “surprising” or “unusual”. It is also described as a sensation of “curious discovery” of something that was not applied or experienced before. However, the sensation of novelty is short lived. Whenever the elements of gamification or the types of educational activities began to repeat, the sensation of novelty faded fast. Gamification elements were defined as “new” and “unexpected”. Informants often draw comparisons between gamified study course and other disciplines in the university. According to them, gamification “finally brought something new”, it was perceived as “original and unexpected”. One interviewee described their sensation of novelty as follows:

*For me engagement is up to the point while it's new, unexperienced. While I don't know, do not understand. Only then I'm interested in researching, I'm engaged in doing. I knew that something new is about to come up in gamified system. That's why I visited it so often. It became a habit on its' own. It was different compared to others. [Zelda]*

Emotional engagement also contributed to sensation of “admiration”. Visual elements of gamified system were defined as “cute”, “captivating”, and “charming”. However, for some students visual elements associated with “childish” activities. Few informants stated that gamification elements “are not necessary in university studies” because they “are not in the kindergarten anymore”. They added that “there’s nothing wrong with play”. However, students “shouldn’t need some sort of games in order to learn”. In other words, gamification elements for some students worked as force that reduced the “seriousness of study process”. Sometimes visuals of the gamified system associated with “visual noise” that suppressed the most important part of university studies – learning. Emotional engagement was one of the main affections that led to experience of fun. Interviewees claimed that variety of optional activities made it “fun to explore”. In this case fun is perceived as emotional reaction related with joy.

**Cognitive engagement.** This form of engagement is associated with intellectual challenge and ability to overcome it. Cognitive engagement is resulting the sensation of serious fun that is experienced when knowledge is being generated or gained during the learning process. According to research data, successful application of newly acquired information caused positive emotions, often described as “rewarding”. Informants admitted that hard tasks required “stepping beyond the limits” of oneself. It was noticed that students “worked very hard” and “it wasn’t easy”. Still, the ability to overcome the challenge was rewarding and participant of the gamified course stated that they “liked it that it wasn’t easy”. Cognitive engagement was also expressed through communication and negotiations with other group members. Although the

process of “figuring out something new out of nothing” was at some point frustrating, the final result was rewarding and fun. On the contrary to easy forms of fun, associated with the emotion of joy, cognitive engagement situated fun arise from interest and gathering of new knowledge, a satisfaction of “being better than you were yesterday”. More abstract tasks created higher challenges thus resulting higher emotional reward when the activity was completed successfully. Gamification elements in this context served as facilitators of competition and feedback. Competition was described as “healthy at certain extent” and was oriented towards others, as well as oneself. According to informants, intellectual work with others “allowed experiencing the sense of fellowship”. Also, cognitive engagement was experienced in those cases when skill level matched the challenge.

*I'm engaged in those tasks where I feel that my skill level is sufficient enough. Where I can achieve more and to overcome my limitations. [Mario]*

**Agentic engagement.** Gamification in the sense of agentic engagement works as a medium for collaboration and competition. It affects engagement indirectly. In most of the cases it is being expressed through positive feedback for contribution to study material. In all three interview stages informants emphasized on the importance of the relationship between educator and the students. The exchange of knowledge ensures warmer atmosphere in the class. Learning process seems less “constrained” and more creatively empowering. Ability to “contribute to study material” and freedom to “choose” the ways of progression was mention among the most important engagement facilitators. When asked about educational content creation, informants noted that it allows them to “try to fit lecturers’ shoes”. Research participants also added that ability to test their knowledge in practice is highly valued. Agentic engagement was expressed through intellectual and personal growth. Data analysis revealed that those activities that required contribution and participation also improved creative capabilities. Through expression of creative ideas group members could learn and improve. One interviewee elaborated on the importance of creative activities:

*Your ideas have to be connected with the knowledge that you gained. It's challenging but attractive at the same time. You're fully into it and you need to show what you can come up with, how to present it, how to demonstrate the skills that we obtained in the classes. [Alma]*

Agentic engagement is expressed through interactions with other group members. Possibility to learn from each other mistakes allowed to “feel more emphatic and tolerant”. Content creation together was perceived as transformative, forcing to “rethink the characters and performances” of colleagues. At the same time collaborative work fostered openness to new ideas. One of the students claimed that “engagement comes through discussions and communication with others. It seems like you can do the same things again and again”. Contributing to the content of the course by collaboration was positively evaluated by other interviewees as well. Some students revealed that they were so “engaged that the project was finishes in one night”. For them discussions among group members seemed “very interesting”. This form of

engagement rises from well overthought and valued learning process that is oriented towards quality of the final result.

On the other hand some students felt disengaged by collaborative activities and were preferring to work on their own. According to them “you cannot trust your teammates at one hundred percent”. Attitude problems, as well as differences in value systems and personality traits led to “conflicts within the group”. In those instances dominating characters tried to force their ideas into action. This created tension and “negative emotional climate” that later converted into disengagement.

## Discussion

The results of the study show that engagement in gamified study course is affected by 3 motivational factors and has 6 forms of engagement expression. Literature analysis revealed that engagement is being interpreted differently in educational sciences and game studies. In educational context engagement is explained as long-term process, while in game studies it is more focused on short term experiences. Results of this study support the claim that engagement is multidimensional construct and in some extent cover behavioral, emotional, and cognitive dimensions, similarly to other authors (Jimerson, Campos, & Grief, 2003; Fredricks, Blumenfeld, & Paris, 2004; Hoffman & Nadelson, 2010). However, behavioral engagement reveals itself through participation and rush in the context of this study. The dimension of agentic engagement, analyzed by Reeve & Tseng (2011), was also present during the gamified course. Literature review revealed that when gamification is being applied in learning environments, engagement is rarely conceptualized. However, in those gamification studies where engagement is being elaborated on, game-like approach to engagement is more common.

This study shows that application of gamification in university study course cause long-term and short-term forms of engagement to overlap. Interview analysis confirmed the claim that consensus based approach on engagement should be found when game-like activities are introduced as a part of educational practices. These findings are close to Whitton & Moseley (2014) proposed theoretical model of engagement. However, the current findings are broader in scope and does not find significant evidence that engagement is a hierarchical construct. The results of the study show that motivation and engagement should be treated as separate concepts. According to research results motivation is being explained as long-term phenomenon that is influenced by forms of engagement. This conclusion confirms the claims of Reeve (2012) and supports the idea that motivation could be observed through expression of engagement. Motivational factors serve as foundations for engagement, although their specific relation is not yet clear. Three motivational factors were found during this study. Extrinsic reward and intrinsic satisfaction are close to theoretical conception of intrinsic and extrinsic motivation in games (Przybylski, Rigby, & Ryan, 2010; Rigby & Ryan, 2011). However, the lack of motivation is also having strong role in expression of engagement. These findings have similarities with Skinner, Kindermann, & Furrer, (2008) concept of disaffection.

When gamification is being applied in educational context, engagement acquires expression forms common to games. According to this study, engagement is being expressed through participation, rush, flow, emotional engagement, cognitive

engagement, and agentic engagement. Participation and rush are closest to behavioral engagement (Fredricks, Blumenfeld, & Paris, 2004) but they represent different emotional states and time perspectives. Rush is strongly resulted by the competition and emotional zest but does not necessarily represent the optimal experience of happiness that is commonly associated with the affection of flow (Csikszentmihalyi, 1990; 1997; Csikszentmihalyi, Abuhamdeh, & Nakamura, 2005). Emotional engagement is mostly expressed through easy forms of fun (Lazzaro, 2004; 2009) and the sense of novelty (O'Brien & Toms, 2010). Cognitive engagement is resulted by intellectual challenge and serious forms of fun. Agentic engagement is being experienced through communication with others, contribution to overall study process, and by collaborating with the educator. These results reflect the claims of Skinner, Kindermann, & Furrer, (2008) that focus on the role of educator in experiencing of engagement. It is also close to the agentic engagement conception proposed by Reeve (2012). Gamification is most strongly affecting participation, rush, flow, and emotional engagement. Cognitive and agentic forms of engagement can be facilitated by gamification but are less dependent from the mechanics that are being used in gamified course.

Immersion was one of the affection forms commonly met in scientific literature that was not clearly distinguishable in this study, similarly to Hamari, et al., (2016). It could be caused by more narrative oriented nature of this phenomenon and unclear boundaries of its definition.

### **Limitations and future work**

The current findings are limited by a small sample size of the individuals at specific point in time. Since the research is done in exploratory nature the conclusions cannot be generalized. All the results are contextual. It means that demographic criteria, approach to gamification, group dynamics, and input of the educator could have significant role to the research results. Study reveals qualitative evidence of engagement expression. However, for behavioral forms of engagement mixed method approach could be suited better.

Future research could focus on determining the relations between motivational factors and forms of engagement expression. It would be also beneficial to explore the consensus based theories when educational sciences and game studies are being integrated. The role of an educator in gamified course is clearly underestimated in scientific literature. Future research should focus on explaining how personality traits and teaching techniques of an educator affect forms of engagement in gamified study courses. The notion of immersion is still unestablished in interdisciplinary studies so it could become a researchable problem for future work.

### **Conclusion**

Interdisciplinary studies require consensus based approach to phenomenon of engagement. Study revealed that understanding of engagement in educational sciences and game studies is different. However, when these two fields are being merged together, new approach to conception of engagement is needed. Study helped to answer the research question: What forms of engagement does the students

experience during the gamified study course? Results show that engagement should be separated from the motivation. Motivational factors affect the expression of engagement but their specific relations are debatable. Qualitative data analysis revealed that during the gamified study course engagement was expressed in 6 different forms: participation, rush, flow, emotional engagement, cognitive engagement, and agentic engagement. All of these forms of engagement expression share conceptual features from educational sciences and game studies. Research results allow claiming that when gamification is being applied in educational contexts, engagement could gain short-term affective features. However, there is also evident that research participants perceive engagement as a momentary experience, and as a long-term sensation. Because of this unified theory of engagement should be explored in future studies where education and gamification are integrated.

## References

- Aleven, V., Myers, E., Easterday, M., & Ogan, A. (2010). Toward a framework for the analysis and design of educational games. *Digital Game and Intelligent Toy Enhanced Learning (DIGITEL), 2010 Third IEEE International Conference* (pp. 69-76). IEEE.
- Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruickshank, K. A., Mayer, R. E., & Pintrich, P. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of bloom's taxonomy of educational objectives*. New York: Longman.
- Annetta, L. A., Minogue, J., Holmes, S. Y., & Cheng, M. T. (2009). Investigating the impact of video games on high school students' engagement and learning about genetics. *Computers & Education, 53*(1), 74-85.
- Bazeley, P. (2013). *Qualitative data analysis: Practical strategies*. SAGE Publications Inc.
- Bogost, I. (2011a, August 9). *Gamification is bullshit*. Retrieved from <https://www.theatlantic.com/https://www.theatlantic.com/technology/archive/2011/08/gamification-is-bullshit/243338/>
- Bogost, I. (2011b, May 3). *Persuasive games: Exploitationware*. Retrieved from Gamasutra: [https://www.gamasutra.com/view/feature/6366/persuasive\\_games\\_exploitationware.php](https://www.gamasutra.com/view/feature/6366/persuasive_games_exploitationware.php)
- Boyle, E., Connolly, T., Hainey, T., & Boyle, J. M. (2012). Engagement in digital entertainment games: A systematic review. *Computers in Human Behavior, 28*, 771-780.
- Bormann, D., & Greitemeyer, T. (2015). Immersed in virtual worlds and minds: effects of in-game storytelling on immersion, need satisfaction, and affective theory of mind. *Social Psychological and Personality Science, 6*(6), 646-652.
- Braun, V., Clarke, V., & Terry, G. (2012). Thematic analysis. In H. Cooper, P. Camic, L. D. M., A. Panter, D. Rindskopf, & K. Sher, *APA handbook of research methods in psychology* (pp. 57-71). American Psychological Association.
- Brown, E., & Cairns, P. (2004). A grounded investigation of game immersion. In E. Dykstra-Erickson, & M. Tscheligi, *Proceedings of CHI 2004* (pp. 1297-1300). New York: Association for Computing Machinery.
- Casual Connect. (2012, March 11). *Player Type Theory: Uses and Abuses / Richard BARTLE*. Retrieved from Youtube.com: <https://www.youtube.com/watch?v=ZlZLbE-93nc&t=816s>
- Chang, J. W., & Wei, H. Y. (2016). Exploring Engaging Gamification Mechanics in Massive Online Open Courses. *Educational Technology & Society, 19*(2), 177-203.
- Christenson, S. L., Reschly, A. L., & Wylie, C. (2011). *The handbook of research on student engagement*. New York: Springer Science.
- Creswell, J. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Boston: Pearson.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper Perennial.
- Csikszentmihalyi, M. (1997). *Finding flow*. New York: Basic.
- Csikszentmihalyi, M., Abuhamdeh, S., & Nakamura, J. (2005). Flow. In A. Elliot, & C. Dweck, *Handbook of competence and motivation* (pp. 598-608). New York: Guilford Publications.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining gamification. *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9-15). ACM.

Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: a systematic mapping study. *Journal of Educational Technology & Society*, 18(3), 75.

Dicheva, D., Irwin, K., Dichev, C., & Talasila, S. (2014). A course gamification platform supporting student motivation and engagement. *Web and Open Access to Learning (ICWOAL), 2014 International Conference*, (pp. 1-4).

Döpker, A., Brockmann, T., Stieglitz, S., & Horbach, M. (2013). Use Cases for Gamification in Virtual Museums . *GI-Jahrestagung*, (pp. 2308-2320).

Douglas, Y., & Hargadon, A. (2000). The pleasure principle: Immersion, engagement, flow. *Proceedings of the Eleventh ACM on Hypertext and Hypermedia* (pp. 153-160). New York: Association for Computing Machinery.

Echeverría, A., García-Campo, C., Nussbaum, M., Gil, F., Villalta, M., Améstica, M., & Echeverría, S. (2011). A framework for the design and integration of collaborative classroom games. *Computers & Education*, 57(1), 1127-1136.

Ermi, L., & Mäyrä, F. (2005). Fundamental components of the gameplay experience: Analysing immersion. *Worlds in play: International perspectives on digital games research*, 37(2).

Filsecker, M., & Kerres, M. (2014). Engagement as a Volitional Construct: A Framework for Evidence-Based Research on Educational Games. *Simulation & Gaming*, 45(4-5), 450-470.

Fitz-Walter, Z., Tjondronegoro, D., & Wyeth, P. (2011). Orientation passport: using gamification to engage university students. *23rd Australian computer-human interaction conference*, (pp. 122-125).

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. . *Review of Educational Research*, 74, 59-109.

Fuster, H., Chamarro, A., Carbonell, X., & Vallerand, R. J. (2014). Relationship between passion and motivation for gaming in players of massively multiplayer online role-playing games. *Cyberpsychology, Behavior, and Social Networking*, 17(5), 292-297.

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, motivation, and learning: A research and practice model. *Simulation & Gaming*, 33, 441-467.

Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in human behavior*, 469-478.

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? - a literature review of empirical studies on gamification. *System Sciences (HICSS), 2014 47th Hawaii International Conference* (pp. 3025-3034). IEEE.

Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, 54, 170-179.

Hamzah, W. M., Ali, N. H., Saman, M. M., Yusoff, M. H., & Yacob, A. (2015). Influence of Gamification on Students' Motivation in using E-Learning Applications Based on the Motivational Design Model. *International Journal of Emerging Technologies in Learning*, 10(2).

Harmat, L., de Manzano, Ö., Theorell, T., Högman, L., Fischer, H., & Ullén, F. (2015). Physiological correlates of the flow experience during computer game playing. *International Journal of Psychophysiology*, 97(1), 1-7.

Harmer, A. J., & Cates, W. M. (2007). Designing for learner engagement in middle school science: Technology, inquiry, and the hierarchies of engagement. *Computers in the Schools*, 24, 105-124.

Hoffman, B., & Nadelson, L. (2010). Motivational engagement and video gaming: a mixed methods study. *Educational Technology Research & Development*, 58(3), 245-270.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. *Proceedings of the AAAI Workshop on Challenges in Game AI*, 4.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. *Proceedings of the AAAI Workshop on Challenges in Game AI*. 4. AAAI Press.

Huotari, K., & Hamari, J. (2012). Defining gamification: a service marketing perspective. *Proceeding of the 16th International Academic MindTrek Conference* (pp. 17-22). ACM.

Yee, N. (2006). Motivations for play in online games. *CyberPsychology & behavior*, 9(6), 772-775.

Jennett, C., Cox, A. L., Cairns, P., Dhoparee, S., Epps, A., Tijs, T., & Walton, A. (2008). Measuring and defining the experience of immersion in games. *International journal of human-computer studies*, 66(9), 641-661.

- Jimerson, S. J., Campos, E., & Grief, J. L. (2003). Toward an understanding of definitions and measures of school engagement and related terms. *The California School Psychologist*, 8, 7–27.
- Johnson, B., & Christensen, L. (2017). *Educational research: Quantitative, qualitative, and mixed approaches* (6th ed.). Sage.
- Kalinauskas, M. (2014). Gamification in fostering creativity. *Socialines Technologijos*, 4(1), 62-75.
- Kapp, K. M. (2012). *The gamification of learning and instruction: game-based methods and strategies for training and education*. John Wiley & Sons.
- Kiili, K., de Freitas, S., Arnab, S., & Lainema, T. (2012). The design principles for flow experience in educational games. *Procedia Computer Science*, 15, 78-91.
- Klabbers, J. H. (2018). On the architecture of game science. *Simulation & Gaming*. Retrieved from <https://doi.org/10.1177/1046878118762534>
- Klimmt, C., & Hartmann, T. (2006). Klimmt, C., & Hartmann, T. (2006). Effectance, self-efficacy, and the motivation to play video game. *Playing video games: Motives, responses, and consequences*, 133-145.
- Landers, R. N., Auer, E. M., Collmus, A. B., & Armstrong, M. B. (2018). Gamification science, its history and future: Definitions and a research agenda. *Simulation & Gaming*, 1-23. Retrieved from <https://doi.org/10.1177/1046878118774385>
- Lazzaro, N. (2004). Why we play games: Four keys to more emotion in player experiences. *Proceedings of GDC*, 306.
- Lazzaro, N. (2009). Understand emotions. In C. Bateman, *Beyond game design: nine step toward creating better videogames*. Boston: Charles Rivers Media.
- Leaning, M. (2015). A study of the use of games and gamification to enhance student engagement, experience and achievement on a theory-based course of an undergraduate media degree. *Journal of Media Practice*, 16(2), 155-170.
- Liamputtong, P. (2009). Qualitative data analysis: conceptual and practical considerations. *Health Promotion Journal of Australia*, 20(2), 133-139.
- Liu, T. Y., & Chu, Y. L. (2010). Using ubiquitous games in an English listening and speaking course: Impact on learning outcomes and motivation. *Computers & Education*, 55(2), 630-643.
- Lombard, M., & Ditton, T. (1997). At the heart of it all: the concept of Presence. *Journal of Computermediated Communication*, 3(2).
- Martey, R. M., Kenski, K., Folkestad, J., Feldman, L., Gordis, E., Shaw, A., . . . Strzalkowski, T. (2014). Measuring game engagement multiple methods and construct complexity. *Simulation & Gaming*, 45(4-5), 528-547.
- Murray, J. (1997). *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge: The MIT Press.
- Nacke, L. E., & Deterding, S. (2017). The maturing of gamification research. *Computers in Human Behavior*, 71, 450-454.
- Nacke, L. E., & Lindley, C. A. (2010). Affective ludology, flow and immersion in a first-person shooter. *arXiv*.
- Nelson, M. (2012). Soviet and American precursors to the gamification of work. *Proceedings of the 16th International Academic MindTrek Conference* (pp. 23–26). ACM.
- Nelson, T. Q. (2016). *The role of engagement in synthetic learning environments*. Doctoral dissertation, Colorado State University Libraries.
- Nilsson, N. C., Nordahl, R., & Serafin, S. (2016). Immersion Revisited: A Review of Existing Definitions of Immersion and Their Relation to Different Theories of Presence. *Human Technology*, 12(2).
- O'Brien, H. L., & Toms, E. G. (2010). The development and evaluation of a survey to measure user engagement. *Journal of the American Society for Information Science and technology*, 61(1), 50-69.
- O'Brien, H., & Toms, E. (2008). What is user engagement? A conceptual framework for defining user engagement with technology. *Journal of the American Society for Information Science and Technology*, 245-270.
- O'Donovan, S., Gain, J., & Marais, P. (2013). A case study in the gamification of a university-level games development course. *The South African Institute for Computer Scientists and Information Technologists Conference* (pp. 242-251). ACM.
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks: CA: SAGE.

- Procci, K., Singer, A. R., Levy, K. R., & Bowers, C. (2012). Measuring the flow experience of gamers: An evaluation of the DFS-2. *Computers in Human Behavior*, 28(6), 2306-2312.
- Przybylski, A., Rigby, C., & Ryan, R. (2010). A Motivational Model of Video Game Engagement. *Review of General Psychology*, 14(2), 154-166.
- Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie, *Handbook of research on student engagement* (pp. 149-172). United States of America: Springer.
- Reeve, J., & Tseng, C. M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary Educational Psychology*, 36(4), 257-267.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.
- Rigby, S., & Ryan, R. M. (2011). *Glued to games: How video games draw us in and hold us spellbound*. Praeger.
- Saeed, S., & Zyngier, D. (2012). How motivation influences student engagement: A qualitative case study. *Journal of Education and Learning*, 1(2), 252.
- Schlechty, P. C. (2002). *Working on the Work: An Action Plan for Teachers, Principals, and Superintendents. The Jossey-Bass Education Series*. San Francisco: Jossey-Bass.
- Schoenau-Fog, H. (2011). The player engagement process—an exploration of continuation desire in digital games. *Think Design Play: Digital Games Research Conference*.
- Seaborn, K., & Fels, D. (2015). Gamification in theory and action: A survey. *International Journal of Human-Computer Studies*, 74, 14-31.
- Sharek, D., & Wiebe, E. (2014). Measuring video game engagement through the cognitive and affective dimensions. *Simulation & Gaming*, 45, 569-592.
- Shi, L., Cristea, A. I., Hadzidedic, S., & Dervishalidovic, N. (2014). Contextual gamification of social interaction—towards increasing motivation in social e-learning. *International Conference on Web-Based Learning* (pp. 116-122). Springer.
- Sillaots, M. (2014). Achieving flow through gamification: a study on re-designing research methods courses. *European Conference on Games Based Learning* (p. 538). Academic Conferences International Limited.
- Skinner, E. A., Kindermann, T. A., & Furrer, C. J. (2008). A Motivational Perspective on Engagement and Disaffection: Conceptualization and Assessment of Children's Behavioral and Emotional Participation in Academic Activities in the Classroom. *Educational and Psychological Measurement*, 493-525.
- Tan, M., & Hew, K. F. (2016). Incorporating meaningful gamification in a blended learning research methods class: Examining student learning, engagement, and affective outcomes. *Australasian Journal of Educational Technology*, 32(5).
- Turner III, D. W. (2010). Qualitative interview design: A practical guide for novice investigator. *The qualitative report*, 15(3), 754-760.
- Vaibhav, A., & Gupta, P. (2014). Gamification of MOOCs for increasing user engagement. *MOOC, Innovation and Technology in Education (MITE), 2014 IEEE International Conference*, (pp. 290-295).
- Walz, S., & Deterding, S. (2015). *The Gameful World: Approaches, Issues, Applications*. MIT Press.
- Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press.
- Whitton, N., & Moseley, A. (2014). Deconstructing Engagement: Rethinking Involvement in Learning. *Simulation & Gaming*, 45(4-5), 433-449.
- Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps*. O'Reilly Media Inc.



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