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Gamifying Teacher Students' Learning Platform

Information and Communication Technology in Teacher Education Courses

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ABSTRACT

This paper presents initial results from a study exploring teacher students' experiences related to the gamification of an online learning platform in higher education. The aim was to get an understanding of the participants' views regarding the use of game elements and to examine the user type profile of this group in order to explore the potential of applying user types in planning gamification solutions for teacher students. The participants' overall experience of having game elements as part of their course platform was principally positive. User types students presented were investigated using the Hexad scale adapted from game design: in this user group, Socialiser and Philanthropist were the predominant types while Disruptor was by far the least common one. In terms of learning tasks, the participants expressed being motivated particularly by tasks with a strong creative focus. The findings inform us about the directions to take in the development of suitable solutions for supporting teacher students' motivation in online and blended learning.

CCS CONCEPTS

Applied computing~Education~E-learning

KEYWORDS

Gamification, Higher education, Teacher students, Online learning, Blended learning, User types

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1 Introduction

Gamification has been applied and studied extensively in various fields and topic areas. The main objective of bringing game design elements and mechanisms into non-game contexts is to make activities and systems more attractive and motivating [1, 2, 3]. Educational settings are one of the main contexts where the potential of gamification has been explored.

1.1 Gamification in education

Gamification can be seen as one form of game-based pedagogy [4]. In education, game elements have been found to support motivation and to have a positive effect on focusing on and completing tasks [5, 6].

In our prior studies that were also set in the context of online learning in higher education, we discovered that there were two main aspects to tackle in our case: motivating the students to put more focus on the tasks presented within the learning platform and supporting them to use the platform more regularly and evenly throughout the whole course instead of concentrating their efforts to the very end of the course [7, 8].

This year, these challenges have become ever more relevant due to the drastic increase in distance learning as a result of the COVID-19 pandemic. The increased emphasis on independent studying on online platforms calls for novel, yet relatively easily implementable solutions and techniques for making online learning experiences motivating and effective for all students [9].

It is important for gamification to have a clear purpose. In our case, for example, the goal stemmed from the fact that during the academic year, university students have a large number of courses on the same online platform and there is often very little personalisation. We wanted to explore potential ways of supporting the students' opportunities to work in ways that motivate them and facilitating collaboration between students whose motivations align with each other. Ultimately, such approaches may also boost their potential for creative learning [10].

1.2 Adapting gamification to user preferences

One of the problems related to designing gamification is that a specific game element can have very different – even opposite – effects on the motivation and actions of different individuals [11, 12]. To tackle the challenge of differences in motivational orientations, the key is to know one’s users. Different player type or user type models [11, 13, 14, 15, 16] can be a useful tool in investigating the needs and preferences of the intended target group.

In Bartle’s [13] seminal paper on player types, players were grouped into Killers, Achievers, Socializers and Explorers. Since the introduction of Bartle’s taxonomy, plenty of research has been conducted on player types, and modified models have been suggested [e.g. 11, 14, 15, 16]. To roughly summarise the general concept of player types, we can say that some players are primarily motivated by the social dimension of playing, others are driven mainly by competition or achievement (either competing against others or attempting to beat their own prior accomplishments), while yet others are interested in exploring the possibilities offered by the game environment and immersing themselves into it [e.g. 17].

While most player type models have not been developed with gamification in mind, the Hexad model [15] is tailored especially for gamified environments. This model identifies six user types that are motivated by different aspects [15]:

1. *Philanthropists*: motivated by purpose, being altruistic and willing to give without expecting a reward
2. *Socialisers*: motivated by relatedness, wanting to interact with others and create social connections
3. *Achievers*: motivated by competence, seeking to progress by completing tasks or prove themselves by tackling challenges
4. *Free Spirits*: motivated by autonomy, wanting to create and explore
5. *Players*: motivated by extrinsic rewards despite the type of the activity
6. *Disruptors*: motivated by the triggering of either negative or positive change, wanting to test the boundaries of the system

In previous studies based on the Hexad model [12, 16, 18, 19], Philanthropists, Free Spirits and Achievers have been the predominant user groups while Disruptors have been the least common type. In a study that was conducted in a higher education context [20], Philanthropist was by far the most common type, Free Spirit the second most common, and they were followed by Socialiser. The Socialiser type was significantly more common among female than male students [20].

1.3 Aims of the study

In this study, we experimented with simple game elements embedded in an online learning platform in a higher education context. The aim was twofold. Firstly, we sought to obtain an understanding of the views of our specific target group (teacher

students) regarding the use of gamification in education. Secondly, we wanted to examine the user type profile of this group in order to explore the potential of applying user types in planning gamification solutions for them.

2 Methodology

The study was carried out between October and December 2019 in the context of a university course.

2.1 Context and setting

The pilot course, *Information and Communication Technology*, was intended for teacher students (Master of Education degree). It was a mandatory bachelor-level course principally aimed for first-year students who had recently started their university studies.

The aims of the course were related to learning to use the university ICT services and tools, using cloud-based services individually and collaboratively, and learning the basics of the ethical use of ICT both as students and as professionals. In addition, the students learned about the role of ICT in the field of education and familiarised themselves with different applications and with acquiring information.

The course was implemented in the form of blended learning, entailing both face-to-face sessions and material and tasks on an online platform. The course consisted of ten demo sessions, each of which focused on a specific topic (such as using presentation software, creating simple websites, using different Google tools, word processing, the basics of information security, copyrights, and the basics of programming). After each demo session, the students were expected to complete a related task. The tasks were instructed and submitted via the online platform.

The online learning platform used in the course was Moodle 3.6. During the first half of the course, Moodle was used without any gamification. Halfway through the course, a gamified version was introduced. It included three main game elements that were implemented using the standard tools available on the Moodle platform:

1. A background *narrative* about a School of Digital Wizards was presented. The theme was reflected also in the visual appearance of the gamified Moodle course.
2. Each student had an *avatar* related to the narrative (a digital wizard). As a student completed compulsory course tasks, the wizard progressed from one level to the next (see Figure 1). Reaching the final level indicated that the student had passed the course. In terms of the narrative, a completed avatar implied that the Digital Wizard was ready to step into the digital world on their own.
3. When students completed non-compulsory extra tasks related to different topics, they were awarded *badges*. The badges were topic-specific, such as Copyright Guru or Programmer (see Figure 1).



Figure 1: Examples of the avatar (top row) and the badges (bottom row)

Each element intended to serve a specific purpose. The narrative aimed to enhance the users' immersion in the gamified learning environment. The purpose of the avatar was to visualise progress while also supporting immersion. The goal of the badges was, on the one hand, to encourage the students to practice more, and on the other hand, to meet the preferences of achievement- or competition-oriented users.

2.2 Participants

The group of participants (N=76) consisted principally of first-year teacher students in a Finnish university. Table 1 presents the age and gender distribution of the participants. Over a half of the group were between 20 and 24 years of age, and the majority of the participants were women.

Table 1: Age and gender (N=76)

Demographic information	N	%
Age		
Under 20	13	17.1
20–24	54	71.1
25–29	4	5.3
30 or over	5	6.6
Gender		
Woman	63	82.9
Man	11	14.5
Other	-	-
Do not want to tell / Not stated	2	2.6

In addition, the participants were asked about their game-playing habits (Figure 2) and their prior experience with online learning platforms (Figure 3). The participants can be described as casual gamers; only 10.5 % of them stated that they play on a daily or almost daily basis. Most of them had at least some previous experience of using online learning platforms.

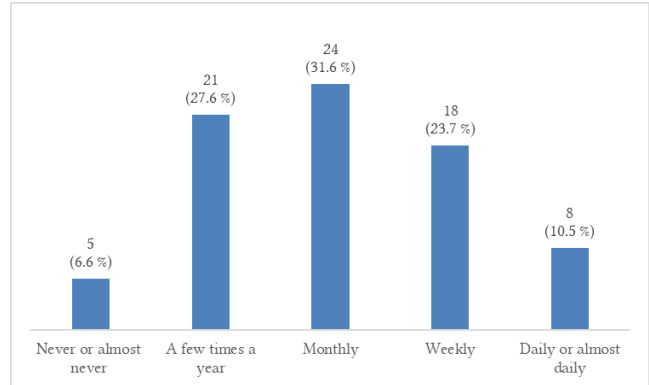


Figure 2: Frequency of playing digital or non-digital games (N=76)

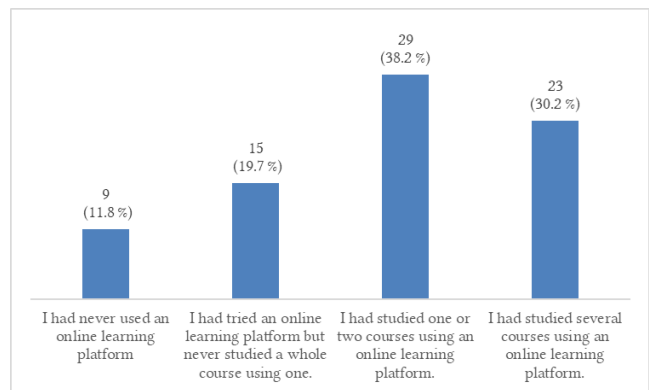


Figure 3: Familiarity with online learning platforms (N=76)

2.3 Data collection

We collected data with two online questionnaires. The first questionnaire, which the participants answered at the beginning of the course, included a user type instrument aiming to provide us with information of the most typical user types in this particular target group. For this purpose, we used the Gamification User Types Hexad scale [16, 18]. The scale allows us to identify six user types based on the Hexad model [15]: Philanthropists, Socialisers, Achievers, Free Spirits, Players, and Disruptors. The instrument [16] consists of 24 statements (four statements per user type), and the respondents indicate their agreement or disagreement with the statements on a seven-point Likert scale. Thus, the highest possible total score for each of the six user types is 28 and the lowest possible score is 4.

The second questionnaire was administered at the end of the course. In this questionnaire, the participants evaluated their experience and reflected on the use of the gamified online learning platform. The students were asked to rate the game elements used on the platform and to give feedback on the learning tasks they were expected to complete during the course.

3 Results

This section presents our findings and observations related to the students' user type distribution, their gamification experience and their course tasks preferences, respectively.

3.1 User types

Table 2 presents the results of the user type survey. We found out that among the participants of our study, the total scores for Socialiser (mean score 24.9) and Philanthropist (24.4) were considerably higher than those of any other user types. They were followed by Free Spirit, Achiever and Player, respectively. The distinctly lowest score (13.6) was found in the Disruptor category.

Table 2: User type distribution (N=76)

User type	Mean score (min 4, max 28)	S.D.
Socialiser	24.9	2.58
Philanthropist	24.4	2.23
Free Spirit	22.3	2.88
Achiever	21.5	3.06
Player	20.7	2.52
Disruptor	13.5	3.10

3.2 Gamification experience

Table 3 illustrates the participants' general experience concerning the gamified course platform. Overall, the results were promising in terms of the feasibility of using gamification with this target group. At the end of the course, the participants' stance towards studying on an online platform was somewhat higher compared to their expectations at the beginning of the course. When they were directly asked which version of the platform they preferred, the gamified version that was introduced halfway through the course was slightly favoured over the original, non-gamified one.

As to the individual game elements, the results were in line with the overall preference: each of the three main game elements was seen to have slightly increased the students' motivation. The use of an avatar to visualise progress was rated highest of the three. The game element question also included a text field where the students could mention additional aspects or features that had affected their motivation. They brought up issues such as having a clear structure and being offered a varying selection of tasks.

Table 3. Participants' views about the gamified elements (N=76)

Item (Scale: 5-point Likert)	Mean	S. D.
Thoughts on studying on an online platform (1 = very negative, 5 = very positive)		
Expectations before the course	3.5	.76
Stance after the course	4.0	.60
Preference of gamified vs. non-gamified	3.7	.84

version (1 = strong preference for the non-gamified version, 5 = strong preference for the gamified version)		
Motivational effect of the gamified elements (1 = decreased motivation significantly, 5 = increased motivation significantly)		
Visualisation of progress with avatar	3.8	.67
Collecting badges	3.6	.68
Digital Wizard narrative	3.5	.66

3.3 Course task preferences

The final questionnaire included an open-ended question that aimed at uncovering which course tasks the participants saw as particularly motivating. Many answers highlighted tasks that allowed them to be creative and produce something.

I loved all the tasks where you could create imaginative things. [They] were all particularly fun and I really liked doing them!

I thought it was fun to make my own animation and game and to play others' creations afterwards. Making my own website was fun too because I was very satisfied with the topic I chose.

Some students had been motivated especially by challenge and by having plenty of choice. Only one student referred to game elements in conjunction with motivating tasks.

I found the final task particularly interesting because it challenged me to think and offered many possible ways to implement it.

The secret task where you could win a tinfoil hat was fun.

4 Conclusions

The purpose of this study was to get an understanding of the gamification-related preferences of teacher students in order to provide them with online learning environments that have a positive effect on their motivation. Although the number of participants was fairly small (N=76), these preliminary results offer useful insights into the motivational profile of this specific group.

The results of the Hexad user type survey revealed a very strong focus on a social and collaborative orientation: among teacher students, Socialiser and Philanthropist were much more common than the other four user types. This finding differs from other studies [12, 16, 19] where Philanthropist, Free Spirit and Player have been the prevalent types. Philanthropist, followed by Free Spirit, dominated also the results of an earlier study conducted in higher education [20]. However, among university students, Socialiser emerged as a common user type as well, in particular among women [20].

When we interpret our findings in light of these previous studies, we can propose some explanations. Firstly, the

Philanthropist type appears to be a common user type in general, which is why it is not surprising that it received a high mean score also among our participants. Furthermore, we can make the assumption that teacher students in particular can be expected to be motivated by philanthropism [cf. 20]. A similar assumption might be made also regarding the high occurrence of the Socialiser type in our data. In addition, it is noteworthy that approximately 83 % of our participants were women, which can explain the prevalence of the social orientation [cf. 20].

The Socialiser and Philanthropist types have also been found to be strongly correlated [16]. One possible implication of this is that collaborative activities are likely to motivate both socialisers and philanthropists. Hence, we can hypothesize that providing collaborative opportunities is a priority when developing gamified course platforms intended for teacher students.

In addition, it is worth noting that the features of an online learning platform cannot be assessed in isolation from its contents. Gamification is not a goal per se; its purpose is to support motivation and engagement, and game elements should not appear contrived to the users. Game elements are therefore not the only factor to consider when planning potential solutions for meeting the users' preferences and tapping into their motivational orientations. In many cases, task types and contents might play a more significant role than actual game elements in shaping the students' experience and in responding to the needs and preferences of a particular user type. In our results, for example, creative tasks were evaluated as motivating by the participants.

The next step in our work is to repeat the user type survey with another group of teacher students in order to verify our conclusions. If the current findings are supported also by new evidence, further development of the course platform will focus on designing different ways of improving the social and collaborative dimensions.

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