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THE ATTRACTIVENESS OF A DIDACTIC GAMIFICATION MODEL TESTED IN A POSTGRADUATE PROGRAM

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ABSTRACT. Gamification has emerged as a new approach in solving daily tasks, in various fields, by applying the concepts used by digital game designers, being defined by some promoters of this system as "a process of using game thinking and game mechanisms to involve the user in solving problems" (Zichermann, 2011). Since its conceptual beginnings, somewhere near 2010, gamification has attracted more and more attention from researchers and practitioners, and this has led, according to Koivisto & Hamari (2019), to the implementation of gamification in several areas. As for gamified learning in higher education, it has only received attention since 2013, but has grown rapidly since then (Subhash & Cudney, 2018). The main objective of this research was to measure the level of attractiveness of my first model of didactic gamification, on a reduced structure of only 6 work units. This didactic gamified model was highly appreciated by the participants and was rated valuable on both its qualities: pragmatic and hedonic.

Key words: *gamification, didactics, model, teaching, university.*

REZUMAT. ***Atractivitatea unui model de gamificare didactică testat într-un program postuniversitar*****.** Gamificarea a apărut ca o nouă abordare în rezolvarea sarcinilor zilnice, în diferite domenii, prin aplicarea conceptelor utilizate de designerii jocurilor digitale, fiind definită de unii promotori ai acestui sistem ca „un proces de utilizare a gândirii jocurilor şi a mecanismelor de joc pentru implicarea utilizatorului în rezolvarea problemelor "(Zichermann, 2011). Încă de la începuturile sale conceptuale, undeva în apropiere de 2010, gamificarea a atras din ce în ce mai multă atenţie din partea cercetătorilor şi practicienilor, iar acest lucru a condus, potrivit Koivisto & Hamari (2019), la implementarea gamificării în mai multe domenii. În ceea ce priveşte învăţarea gamificată în învăţământul superior, aceasta a primit atenţie doar din 2013, dar s-a dezvoltat rapid de atunci (Subhash & Cudney, 2018). Obiectivul principal al acestei cercetări a fost măsurarea nivelului de atractivitate a primului meu model de gamificare didactică, pe o structură redusă de doar 6 unităţi de lucru. Acest model didactic gamificat a fost foarte apreciat de participanţi şi a fost apreciat ca fiind valoros atât pentru calităţile sale: pragmatic şi hedonic.

Cuvinte cheie: *gamificare, didactică, model, educaţie, universitate.*

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Introduction

The act of doing something similar to the game is not something new. Over time, people tried to make their activity interesting and even fun, and when a small group of people decided to compete with each other in hunting or a competition and began to keep track of their activities and to compare their scores, then they adopted principles that predominate in modern games to make tasks more engaging (Chou, 2016).

In recent years, gamification has become a very common term thanks to digital game developers who have moved from making simple games aimed only for children to games with strong social involvement and intensely promoted on mobile devices (e.g. Farmville and Angry Birds) which aim also middle-aged people, but elderly people, too (Chou, 2016). Moreover, digital games have entered our daily lives at a fast pace and have now become a major form of entertainment, enjoyed by people from all demographic groups (Koivisto & Hamari, 2019).

Gamification has emerged as a new approach in solving daily tasks, in various fields, by applying the concepts used by digital game designers, being defined by some promoters of this system as "a process of using game thinking and game mechanisms to involve the user in solving problems" (Zichermann, 2011).

Since its conceptual beginnings, somewhere near 2010, gamification has attracted more and more attention from researchers and practitioners, and this has led, according to Koivisto & Hamari (2019), to the implementation of gamification in several areas. As for gamified learning in higher education, it has only received attention since 2013, but has grown rapidly since then (Subhash & Cudney, 2018).

The presence of technology in classrooms has inspired the shift from traditional courses to integrated digital learning environments. These interactive learning environments support the evolution of the teaching process by incorporating game elements that have already demonstrated that they can capture users' attention, motivate towards goals and promote competition, effective teamwork and communication. Gaming and game-based learning systems aim to bring these benefits to the teaching process even to the university level (Subhash & Cudney, 2018).

With the popularization of gamification, which manifested itself in a growing number of gamified applications, research on the effects of gamification also advanced rapidly. What is, however, a big problem for both researchers and practitioners is that scientific research has advanced mainly without an agenda, theoretical guidance or a clear picture of the field (Koivisto & Hamari, 2019).

With all this knowledge gained about gamification so far, in reality a complete gamification of a course can sometimes be difficult to design for three main reasons (Koivisto & Hamari, 2019, p. 199):

1) Games are complex, multifaceted, and therefore difficult to holistically transfer to other environments;

2) Gamification involves motivational information system design which entails an understanding of (motivational) psychology; and

3) The goal of gamification is often to affect behavior, and this adds yet another layer to the scope of gamification design.

In my opinion, at a macro level, gamification of teaching process means to plan the best "game experience" for a student who processes the material of my course and to whom is asked to properly solve, with specific deadlines, the tasks imposed by the teacher, whether assigned individually or in teams. This idea was the basis for the construction, in 2019, of this Didactic Gamification Model (DGM).

Objectives

The primary objective of this research was to measure the level of attractiveness among participants for this Didactic Gamification Model (DGM).

A secondary objective of this study aimed to quantify the 2 qualities of this system (pragmatic & hedonic).

Material and methods

The research took place in May 2019 with students participating in a professional training program at "Babeş-Bolyai" University Cluj-Napoca. The DGM was applied on a number of 11 students, aged between 22 and 50 years, 4 male subjects and 7 female subjects.

This model of didactic gamification was built for 6 work units. Each unit of work was designed for two hours, and the teaching activities took place over two consecutive days.

Table 1. The outcomes of DGM

Behavioral outcomes / Psychological outcomes	**Content details**	**Game elements**
Compliance with deadlines	The completion of the received tasks on time is rewarded accordingly. Sending inappropriate material leads to loss of points.	XP
Cooperation	Only the first team to perform the task properly is rewarded. Points and distinctions are received.	XP "Team collaboration" Award (cE)

Behavioral outcomes / Psychological outcomes	**Content details**	**Game elements**
Delight / Joy	Many tasks are built with didactic games integrated on the course content.	XP Awards
Fulfilment	The evolution within the system, depending on the XP accumulated is rewarded with military ranks: Marshal - starting with 1350 XP General - starting with 1200 XP Colonel - starting with 1100 XP Lieutenant Colonel - starting with 900 XP Major - starting with 800 XP Captain - starting at 700 XP Lieutenant - starting at 600 XP Second Lieutenant - starting with 500 XP Sergeant Major - starting with 450 XP Sergeant - starting with 400 XP Corporal - starting with 250 XP Soldier - starting with 100 XP	Military ranks
Increased attention to the requirements of the discipline regarding specific rules for individual tasks	The correct timely submission of individual additional tasks is rewarded. Improper submission of individual additional tasks is sanctioned.	XP (experience points)
Involvement in activities offered	For three physical attendances at the course, a Medal of participation (Mp) is awarded. Two "Mp" medals bring a real point to the final grade.	Medal Real points for final mark
Involvement, commitment, interest in the didactic content	Quick answers are rewarded. The first answer receives points and a distinction. The didactic content made with the team is rewarded.	XP “Quick Response” Award (Rr) XP “Team collaboration” Award (cE)
Participation in activities, involvement, commitment to tasks	Two virtual presences bring a point to the final grade.	Real points for final mark
Participation in the gamified system, use of the gamified system	The registration with your own avatar in the game is awarded. Prolonged attention is rewarded. Two "Rr" distinctions equate to a Medal of Attention for quick answers (Mr). Two "Mr" medals bring a virtual presence but which has the same status as the actual attendances (it counts for access to the final examination, according to the requirements of the discipline). Attendance at the course for each course unit is awarded.	Avatar Medal Virtual attendance at the class XP
Perception of additional benefits	Points are awarded in the final grade for additional individual tasks performed accordingly.	Real points for final mark

Behavioral outcomes / Psychological outcomes	**Content details**	**Game elements**
Perception of one's work	Depending on the military rank a student reaches, he or she has the obligation to analyse the work of colleagues and to offer distinctions to lower military ranks.	Awards
Perception of personal contribution	The corresponding didactic content resolved by teams is rewarded. Points and distinctions are received. For two "cE" distinctions, a Team Collaboration Medal (Me) is awarded. Two "Me" medals bring a virtual presence but which has the same status as the actual attendances (it counts for access to the final examination).	XP "Team collaboration" Award (cE) Medal Virtual attendance at the class
Quantification of personal progress	The points obtained for all game elements are used to compile a ranking, after each course unit.	XP
Quantification of total performance	An updated ranking is used after each course unit. At the end of all course units, the order in the ranking brings points to the final grade.	Real points for tasks
Value of contributions / didactic content achieved	The correct completion of the teaching tasks, for each task, is rewarded with points and distinctions.	XP Awards
Vigilance	Quick answers are rewarded. The first answer receives XP and an "Rr" Award.	XP "Quick Response" Award (Rr)

In order to complete the objectives for this research the User Experience Questionnaire (UEQ), version 7 (08.02.2019), developed by Hinderks, Schrepp & Thomaschewski (UEQ Team, 2018) was applied. Data processing was done with the accessories that UEQ Team offers on their website.

The applied research also included a question, additionally introduced by the author: *How often have you played, digital games, on your computer / phone (strategy games, role-playing games, Angry Birds, Candy Crush Saga, etc.)?* The variants offered were 5 in number, with the following explanations: never, very rarely (several times a year), rarely (once, two or three times a month), often (once, twice a week), very often (every day or at least every second day).

The questionnaire was applied twice, after each group of 3 course units in order to compare the results between the two days of activities but also to see if the students appreciate the applied model differently, between the middle of the period and the final phase. I also wanted to check if there are differences between users who participated at 3 course units only and users who participated at the entire gamified system.

The differences of appreciation of DGM, from the students, between the end of the didactic activity and its first half were verified only for students who participated to all 6 didactic units. They completed a set of questionnaires at the end of the first day, after 3 units and at the end of the second day, after all 6 units. Of the 11 participants, only 5 students participated to all 6 units.

Results

The scores obtained after analysing the attractiveness of the system, along with the other aspects measured by UEQ, can be seen in Chart 1.

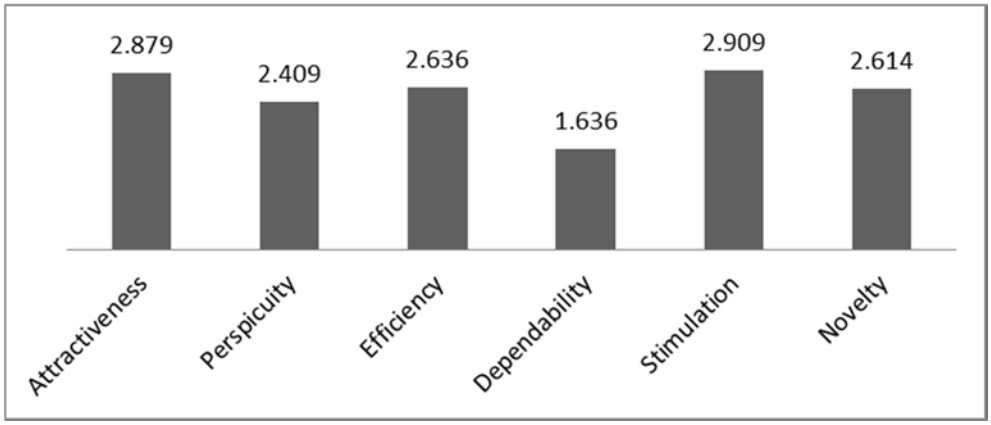

Chart 1. DGM results for all scales (all participants)

The scores of the two qualities of DGM, they are listed in the following Table 2.

Table 2. DGM scores for its two qualities (all participants)

Quality	Points
Pragmatic	2.23
Hedonic	2.76

The results after the first half of the teaching process with DGM can be observed in Chart 2, and in Table 3 you can check the scores for the two qualities of DGM.

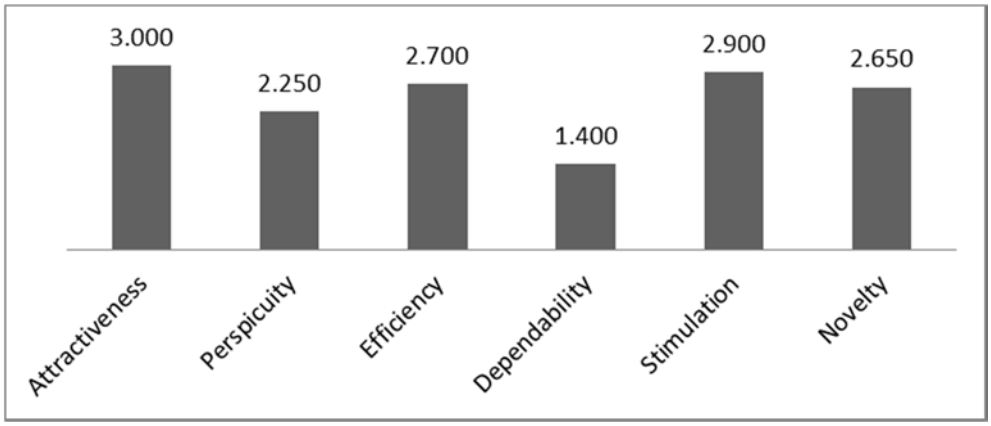

Chart 2. DGM results (after 3 units)

Tabel 3. DGM scores for its two qualities (after 3 units)

Quality	Points
Pragmatic	2.18
Hedonic	2.78

The results of the DGM at the end of the activity can be seen in Chart 3, and the DGM scores for its two qualities are listed in Table 4.

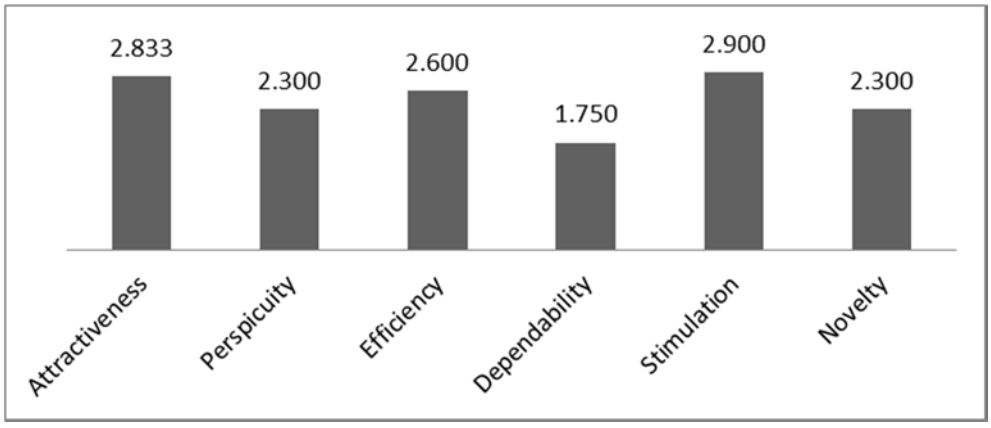

Chart 3. DGM results (after 6 units)

Tabel 4. DGM scores for its two qualities (after 6 units)

Quality	Points
Pragmatic	2.22
Hedonic	2.60

Regarding the reporting of participants in DGM, depending on their degree of familiarity with digital games, two of the 11 students mentioned that they have never enjoyed digital games, 6 stated that they rarely play, and 3 students play often. Therefore, I established two data sets: rare and frequent. The results for the two groups of students can be seen in Chart 4 & Chart 5 and in Table 5 & Table 6.

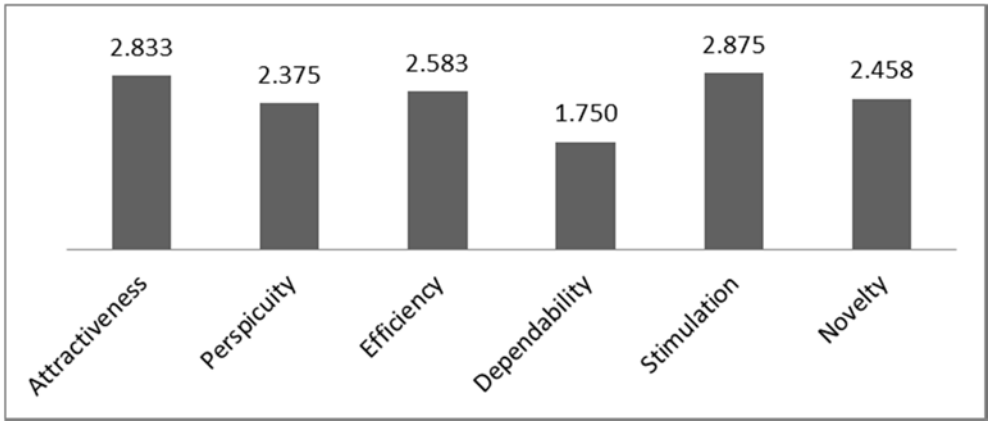

Chart 4. DGM results (participants who rarely use digital games)

Tabel 5. DGM scores for its two qualities
(participants who rarely use digital games)

Quality	Points
Pragmatic	2.24
Hedonic	2.67

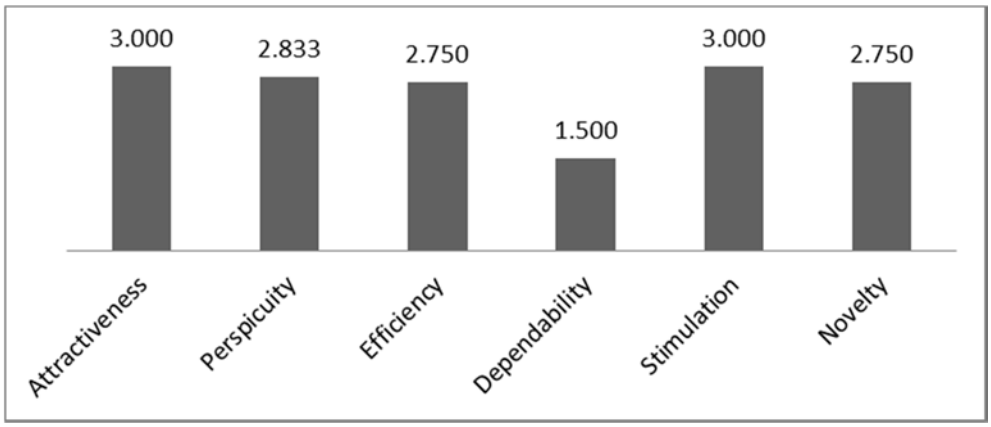

Chart 5. DGM results (participants who often use digital games)

Tabel 6. DGM scores for its two qualities
(participants who often use digital games)

Quality	Points
Pragmatic	2.36
Hedonic	2.88

Discussions

The score obtained by DGM for general attractiveness is very high (close to the maximum value of 3), therefore, it can be stated that the general attractiveness of DGM, perceived by all participants at the end of the teaching program, was very good. This statement is also sustained by a high percentage obtained for hedonic quality. DGM obtained a very good score for hedonic quality, but also a good score for pragmatism. The participants considered that this model of didactic gamification was both useful and pleasant.

For the first half of this teaching process the hedonic quality peaked maximum, recording a slightly lower score at the end. Although it is not a statistically significant difference, it can be attributed to the "novelty effect" that other researchers recall (Koivisto & Hamari, 2019).

For those who often play digital games this DGM presented a high general attractiveness, being more pragmatic and more hedonic than for those who rarely play digital games.

Conclusions

This DGM was highly appreciated by the participants and was rated as valuable on both its qualities: pragmatic and hedonic.

Testing of this DGM was a great opportunity to verify the possibilities of using gamification as efficiently as possible for my future didactic systems.

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