# TURKISH TEACHERS' GAMIFICATION USER TYPES AND PREFERENCES OF GAME ELEMENTS FOR THEIR INSTRUCTION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

MERVE ÖZDEMİR

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY

SEPTEMBER 2023

Approval of the study:

**TURKISH TEACHERS' GAMIFICATION USER TYPES AND PREFERENCES OF GAME ELEMENTS FOR THEIR INSTRUCTION**

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# ABSTRACT

## TURKISH TEACHERS' GAMIFICATION USER TYPES AND PREFERENCES OF GAME ELEMENTS FOR THEIR INSTRUCTION

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September 2023, 112 pages

Gamification has become quite widespread in various fields worldwide, including education. The user or player type approach, which departs from the one-size-fits-all model, provides tailored gamified experiences aligned with individual motivations. This study aims to identify gamification user types of in-service teachers in Turkey and explore potential differences based on demographic factors. It also investigates teachers' preferred game elements for their instruction. Furthermore, the relationships between gamification user types and preferred game elements were investigated. Participants are 1961 in-service teachers who took part in "Digital Teachers Project", emphasizing their role as designer teachers. The study employed descriptive, causal comparative, and correlational research methods. The results indicated that the dominant gamification user type among teachers is the philanthropist, followed by free spirit, achiever, socialiser, and player, along with disruptor being the least dominant user type. The top five game element preferences among in-service teachers are reinforcement and feedback, onboarding, relationships, narrative, and teams. Moreover, weak correlations were found between some game elements and gamification user types.

For instance, player is associated with more game elements (nine in total) compared to other types among gamification user types; achievements, challenges, badges and points have a weak but positive correlation with the player user type. Another important finding is that a game element has correlations with more than one user type. i.e. it was preferred by several user types, e.g. relationships have correlations with all user types. In conclusion, understanding in-service teachers' gamification user types may greatly benefit teacher professional development, assist gamification designers and policymakers in creating more engaging educational materials, and address the gap in the literature regarding gamification user types among in-service teachers.

Keywords: Gamification, gamification user types, HEXAD, game elements, in-service teacher

# ÖZ

## TÜRK ÖĞRETMENLERİN OYUNLAŞTIRMA KULLANICI TÜRLERİ VE EĞİTİMLERİ İÇİN OYUN ÖĞELERİ TERCİHLERİ

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Eylül 2023, 112 sayfa

Oyunlaştırma, eğitim de dahil olmak üzere dünya çapında çeşitli alanlarda oldukça yaygın hale gelmiştir. Herkese tek beden elbise yaklaşımından uzaklaşan kullanıcı veya oyuncu tipi yaklaşımı, bireysel motivasyonlarla uyumlu, kişiye özel oyunlaştırılmış deneyimler sunmaktadır. Bu çalışma, Türkiye'deki hizmet içi öğretmenlerin oyunlaştırma oyuncu tiplerini belirlemeyi ve demografik faktörlere dayalı potansiyel farklılıkları araştırmayı amaçlamaktadır. Ayrıca öğretmenlerin tercih ettikleri oyun unsurları da araştırılmaktadır. Buna ek olarak, oyunlaştırma kullanıcı türleri ile tercih edilen oyun öğeleri arasındaki ilişkiler incelenmektedir. Katılımcılar, tasarımcı öğretmen rollerini vurgulayan "Dijital Öğretmenler Projesi"nde yer alan 1961 hizmet içi öğretmenden oluşmaktadır. Çalışma tanımlayıcı, nedensel karşılaştırmalı ve ilişkisel araştırma yöntemlerini kullanmıştır. Sonuçlar, öğretmenler arasında baskın oyunlaştırma kullanıcı tipinin hayırsever olduğunu, bunu özgür ruh, başaran, sosyalleşen ve oyuncuların izlediğini, yıkıcının ise en az baskın kullanıcı tipi olduğunu göstermiştir. Hizmet içi öğretmenler arasında en çok tercih edilen ilk beş oyun öğesi ise pekiştirme ve geri bildirim, işe alıştırma, ilişkiler, anlatı ve takımlardır. Ayrıca, bazı oyun öğeleri ile oyunlaştırma kullanıcı

türleri arasında zayıf ilişkiler bulunmuştur. Örneğin, oyunlaştırma kullanıcı türleri arasında oyuncu diğer türlere göre daha fazla oyun öğesiyle (toplamda dokuz) ilişkilendirilmektedir: Başarılar, zorluklar, rozetler ve puanlar, oyuncu kullanıcı türüyle zayıf ama pozitif bir korelasyona sahiptir. Bir diğer önemli bulgu ise bir oyun öğesinin birden fazla kullanıcı türüyle korelasyonunun olması, yani birden fazla kullanıcı tipi tarafından tercih edilmiş olmasıdır. Örneğin ilişkilerin tüm kullanıcı türleriyle korelasyonu vardır. Sonuç olarak, hizmet içi öğretmenlerin oyunlaştırma kullanıcı türlerini anlamak, öğretmenlerin mesleki gelişimine büyük ölçüde fayda sağlayabilir, oyunlaştırma tasarımcılarına ve politika yapıcılara daha ilgi çekici eğitim materyalleri oluşturma konusunda yardımcı olabilir ve literatürdeki boşluğu giderebilir.

Anahtar Kelimeler: Oyunlaştırma, oyunlaştırma kullanıcı türleri, Hexad, oyun elementleri, hizmet içi öğretmen

To my dear family and all my loved ones...

## ACKNOWLEDGMENTS

Completing this thesis has been a profound journey, one that I could not have undertaken without the support, help, and encouragement of countless individuals who have touched my life. Their contributions, both big and small, have been invaluable in every phase of this work.

Firstly, I would like to start by expressing my gratitude to my advisor, Assoc. Prof. Dr. Göknur Kaplan, who inspired me to advance and develop in the field of computer education and instructional technologies, served as a role model for me throughout my graduate program, and gave me unending support and guidance throughout my research journey.

I also would like to thank my supportive co-advisor, Asst. Prof. Dr. Berkan Çelik. Your invaluable feedback and unwavering support, even when faced with my most trivial questions, were crucial to the completion of this thesis. Your contributions have added depth and clarity to my research, and I have grown immensely under your guidance.

I would love to thank my loving family—my mom, dad, and sister. Your unwavering encouragement and countless sacrifices have illuminated my path throughout this academic journey. Your belief in my abilities has been the cornerstone of my motivation. Thank you for making every challenge surmountable with your constant encouragement, shared laughter, and understanding.

I want to express my gratitude to my best friends for their love, support, and faith throughout this journey. Despite my mood swings and the challenging moments filled with stress, and a lack of motivation, they offered continuous encouragement.

And most of all, I thank myself, the little girl inside me. Sometimes you fell, sometimes you stood up. Maybe you were so tired and unmotivated. But you didn't

stop working. Now you are achieving one of your best goals. My advice to you: Enjoy this beautiful journey and keep learning.

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# CHAPTER 1

# INTRODUCTION

> "Uniquely, games are able to get people to take actions that they don't always know they want to take, without the use of force, in a predictable way."
> (Zichermann & Cunningham, 2011, p. 15).

This chapter covers the study's background, problem statement, purpose of the study, research questions, significance of the research, and definition of terms.

## 1.1 Background of the Study

Different meanings come to mind when the term "game" is used. Which option is meant by game: card or video, multi-participant or individual, relaxing or stressful, goal-oriented or purposeless, entertaining or instructive? The choices can be extended further. It is obvious that a player may have very different expectations from a "game". At this point, it is necessary to determine the definition of the game on which this study is based. Game can be described as an activity that meets four conditions: i) a simulation of a real-world action, ii) an activity involving competition between individuals or groups of individuals, iii) conceptual rather than physical representation and iv) human beings' involvement (Harrison & Barret, 1964).

One of today's most popular forms of entertainment and cultural phenomenon is video games. However, the current shape of these games is the outcome of a lengthy historical process. People gathered around a massive machine, the world's first video game, to play the strategic game, *Nim,* in 1940 at the New York World's Fair in the

United States (Schwartz, 2020). Following that, *Tennis for Two* was one of the first video games designed by American nuclear physicist William Higinbotham in 1958 (Johanns, 2017). On the oscilloscope screen, an easy-to-follow simulation of tennis was being played. After a few years, The Massachusetts Institute of Technology (MIT) created the two-player game *Spacewar!* in 1962, which allowed each player to operate a distinct spaceship (Paris & Paris, 2016). Many future games have been developed inspired by this game.

Eventually commercial games appeared in the market. In 1971, *Computer Space*, the first commercially available coin-operated video game, developed by Nolan Bushnell, was released (Paris & Paris, 2016). After one year, Nolan Bushnell, the creator of *Computer Space*, presented *PONG* that was raised in the arcade, becoming the first hit game in 1972 (Wolf, 2008). With the *Atari 2600*, *Atari* rose to the top of the home video gaming industry in the 1970s (Schwartz, 2020). Between 1977 and 1980, *Nintendo* in Japan produced a collection of five single-game compilations known as the Color TV-Game series (Wardyga, 2023). *The Commodore 64*, a competent but low-cost computer, was released in 1982 and became the best-selling computer ever (Amos, 2018). A game console was also attached to the *C64* when it first debuted in 1987, but this system failed because people who already had computers did not find it appealing. In 1993, initial *CD-ROM consoles* with 3D graphics were released (Fish, 2021). In Japan and the USA, the *Sony Playstation* was introduced in 1994 and 1995, respectively (Wardyga, 2023). The affordable cost of CD-ROMs contributed to its huge popularity.

The development and diversity of games in history has continued until today. Even though it was possible to play online between 1971 and 1983, Xbox Live was the first to make it widely available (Banfi, 2023). Today, the gaming world consists of video streaming services such as Sony, Xbox, and Microsoft that offer personalized gaming experiences. It seems that the adventure of video games under various brands will continue in the coming years. At this point, the necessity arises for the focus to be shifted to the background of gamification, moving away from the context of video

games, which is regarded as the origin of the gamification concept, the primary focus of this study. Expectations and motivations among different players are likely to vary, thus requiring the classification of individuals into specific categories to understand their preferences. This allows for a customized experience to be provided to each player. It is a tailored strategy that will best motivate a certain type of gamer (Orji et al., 2013). Researchers have been studying how to categorize people into different player types for years in order to comprehend and evaluate the differences between players and understand their unique motivations (Yee, 2006). One of the earliest models is Bartle's Taxonomy of Player Types consisting of four types: achiever, explorer, killer, and socializer (Bartle, 1996). Yee (2006), who was inspired by Bartle, offered an empirical model of user motives based on data gathered from 3000 massively multiplayer online role-playing games (MMORPGs). He stated that there are ten motivational sub-components: advancement, mechanics, competition, socializing, relationships, teamwork, discovery, role-playing, customization, and escapism. Another player type model is the BrainHex Model developed by Nacke et al. (2011). They proposed seven player types as follows: seeker, survivor, daredevil, mastermind, conqueror, socializer, and achiever.

Although various user/player frameworks are encountered in the literature when gamification in education is researched, the most suitable user archetype for customized gamification is The Gamification User Types Hexad Scale (Hallifax et al., 2019a). Unlike Bartle's Taxonomy of Player Types, The Hexad scale is a special scale produced only for gamified systems (Marczewski, 2022). The Hexad Scale was firstly proposed by Marczewski (2015), then improved by Tondello et al. (2016). It has six user types that are driven by either internal or extrinsic motivating variables (Tondello et al., 2016). The purpose of the scale is to learn more about user psychology in a gamified environment than merely what kinds of game aspects they like. Numerous gamification studies have successfully used it (Alsofyani, 2023; Andrias et al., 2021; Orji et al., 2018).

Moving beyond player types, professor and game researcher Bartle defines gamification as "turning something not a game into a game" (as cited in Werbach & Hunter, 2012, p. 25). This conceptualization has fuelled the growing popularity of gamification across various domains in recent years, as organizations strive to incorporate gaming elements into non-gaming contexts. For example, it has been used in tourism to boost motivation and enhance the virtual reality tourism experience (Xu et al., 2013; Wei et al., 2023), as well as in digital banking to improve the customer experience (Chuhan et al., 2022). Furthermore, it has gained increasing prominence in the field of education in recent times.

Numerous research studies have highlighted the benefits of gamification in education. Especially during the COVID-19 pandemic, gamification emerged as an effective pedagogical approach, increasing undergraduate students' interest and participation (Rincon-Flores et al., 2022). Furthermore, research investigating the impact of gamification on student academic performance across diverse educational contexts found a significant medium effect size in favour of gamified learning over traditional methods (Bai et al., 2020). Gamification also serves as a strategy to promote and facilitate a state of flow (Hamari & Koivisto, 2014). Within the realm of education, it fosters engagement in online learning environments, motivating students to tackle more challenging tasks (Hew et al., 2016).

## 1.2 Statement of the Problem

In-service teachers embark on their teaching careers after completing pre-service education programs, which equip them with essential teaching competencies, including the creation of effective learning environments (Çenberci, 2021). However, staying current with evolving technology and teaching strategies becomes challenging post-pre-service education, as many teachers lack sufficient professional development in these areas (Johnson et al., 2016). Teachers' professional development is closely linked to their capacity to learn and pass on knowledge to

students (Avalos, 2011). Furthermore, teachers play a vital role as lifelong learners, actively nurturing lifelong learning communities (Hursen, 2016). Consequently, teacher development must extend beyond university education, as it may not sufficiently equip them to navigate the challenges they will face throughout their careers, as noted in the 2009 OECD report (Peña-López, 2009).

In this rapidly evolving educational landscape, one of the most prevalent strategies today is gamification. Gamification has demonstrated a range of positive effects on learner outcomes, including increased motivation (Kaya & Ercag, 2023; Nair & Mathew, 2021; Zourmpakis et al., 2023), enhanced achievement (Kaya & Ercag, 2023), greater engagement (Liu et al., 2023), improved attitude (Rincon-Flores et al., 2023), and increased class attendance (Zainuddin et al., 2023). Given these advantages, it is crucial for teachers to become familiar with this strategy. In essence, teachers need to stay updated more frequently on the latest pedagogical techniques and approaches, as both in-service and pre-service educators are eager to learn more about gamification (Sajinčič et al., 2022). On the other hand, although both groups of teachers are willing to learn and implement gamification, they do not have equal conditions. While there are efforts to train and encourage pre-services in terms of gamification (Franco-Mariscal et al., 2023; Özdener, 2018; Slamet et al., 2019; Yildiz et al., 2021), these are very limited in in-service teachers.

Currently, gamification can be implemented in an educational setting using the digital tools that are readily available. An illustrative example of this is Kahoot, which has been shown to enhance student learning outcomes by facilitating content comprehension, retention, and reflection (Candan & Başaran, 2023). However, there remains a critical need for educators who possess the skills to effectively harness these technologies, particularly within the context of evolving teaching strategies. In essence, successful gamification implementation in the classroom requires well-prepared instructors. As previously mentioned, given the significant benefits of gamification in the modern era, it is essential for teachers to adeptly integrate it into their lessons. For effective implementation, teachers should engage in experiential

learning, as advocated by Dewey (1938), and gain first-hand experience in gamification techniques. Although there are many studies in the literature that investigate the user/player types of the students and pre-service teachers for gamification (Kocadere & Çağlar, 2018; Subirats et al., 2023; Ugur-Erdogmus & Çakır, 2022), there is hardly any study that investigates (in-service) teachers' gamification user types, which in turn reveals the apparent gap in the literature and the need for investigation. Why does such a need exist? Personalizing gamification by identifying user types provides more influential outcomes in user motivation than one-size-fits-all solution (Tondello et al., 2016). For example, when designing a training program for teachers it can lead to more effective and enjoyable learning experiences. This implies that a teacher identified as a player based on their user type, as proposed by Marczewski (2015) for gamification user types, will be proficient in gamified activities that incorporate external rewards like points and badges.

In short, it is quite likely that it will be required to determine gamification user types of in-service teachers and their game element preferences in their gamification designs for several reasons. Firstly, their gamification user types will be beneficial when preparing learning materials for their professional development in accordance with user types. For example, given the importance of emerging teaching strategies, in-service teachers in Turkey can be provided with training opportunities by the Ministry of National Education in order to make teachers get accustomed to gamification. Secondly, gamification designers can create appropriate and subject-specific materials considering the game elements teachers prefer to use in future gamification designs, which can help overcome some of the barriers faced by in service teachers, such as resource limitations.

## 1.3 Purpose of the Study

The primary purpose of this study is to determine the gamification player types of in-service teachers living in various cities of Turkey. In addition, it also aims to determine whether the player types of the teachers differ depending on various variables (age, gender, level, branch). Furthermore, the study aims to reveal teachers' preferred game elements for designing gamification and the relationship between teachers' player types and their preferred game elements.

## 1.4 Research Questions

In line with the purpose of the study, this study will focus on the following research questions:

**1)** What are teachers' player types?

> **1.1)** Do player types differ by teachers' demographics (age, gender, grade level, and branch)?

**2)** Which game elements do teachers prefer for gamification design?

**3)** What is the relationship between teachers' gamification user types and their preferred game elements for gamification design?

## 1.5 Significance of the Study

This study holds significant implications for both gamification and teacher education. The primary aim is to identify the gamification player types among in-service teachers in Turkey. Understanding these player types can significantly contribute to both the theoretical and practical dimensions of professional development for teachers, aid gamification designers and policymakers in crafting more engaging and inclusive educational materials and platforms, and address a

notable gap in the literature related to the identification of gamification user types among in-service teachers. A more in-depth analysis of these issues is as follows:

Firstly, recognizing the various player types among teachers can significantly enhance professional development programs. By tailoring these programs to match the unique preferences and traits of different player types, training sessions can become more engaging and efficient. This can lead educators to develop higher motivation, expertise, and adaptability in incorporating gamified approaches into their teaching strategies, ultimately improving student learning outcomes.

Secondly, comprehending the game elements that appeal to teachers is crucial for creating successful gamified learning environments. Gamification designers and policymakers can produce more engaging instructional materials and platforms by taking teachers' preferences into account. Additionally, understanding potential differences in player types based on demographic factors such as age, gender, grade level, and branch can lead to more inclusive educational methods. By identifying these variations, gamified educational content can be tailored to suit a variety of educators and students.

Thirdly, this study makes a significant contribution to the literature by addressing the gap in determining in-service teachers' gamification user types, a topic that has not been explored before. Furthermore, the uniqueness of this study lies in its focus on in-service teachers, as previous gamification studies in Turkey have mainly involved pre-service teachers (Çakıroğlu et al., 2017; Göksün & Gürsoy, 2019) as mentioned earlier.

In Turkey, gamification studies and its implementations are growing quickly. Turkey is at the top of the list of Asian countries that have published research on gamification in the university context, according to a bibliographic analysis of documents released between 2012 and 2022 (Guerrero-Alcedo et al., 2022). So, this study not only contributes to the growing field of gamification research but also offers insights into

how gamification concepts apply in educational settings in Turkey and other countries based on the gamification user type framework.

Another important point is that the participants in this study live in cities in different regions. Since the participants are drawn from various provinces across Turkey, this study enables us to make broad-scale inferences and provides a more comprehensive understanding of the status of teachers in Turkey. Additionally, the study gains importance as participants encompasses various branches and age groups, thus ensuring a high level of diversity.

In summary, the significance of this study hinges on its potential to inform the development of tailored gamified professional development programs for in-service teachers in Turkey. By recognizing the various types of teacher players and their preferred game elements, this research can enhance teacher training, facilitate effective gamification integration, and address obstacles, ultimately benefiting both educators and students within the Turkish educational system.

## 1.6 Definition of the Terms

This section presents the operational definitions of the terms that are used throughout the study:

**Game:** "A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome." (Salen & Zimmerman, 2003, p. 80).

**Gamification:** It is "the use of game design elements in non-game contexts" (Deterding et al., 2011, p.2).

**Non-game context:** It is the use of games for purposes other than entertainment such as learning (Deterding et al., 2011).

**Player & user type:** It is a classification of users or players based on their motivations, preferences, and behaviours. Player type is referred to as user type in the scope of this thesis.

**Game elements:** They are the components that make up a game and give it its unique flavour.

**Teacher as instructional designer:** An educator who uses the principles of design to create instructional environments that are effective, engaging, and meaningful for students.

**Professional development:** It is the process of lifelong learning that helps individuals to develop the skills and knowledge they need to succeed in their careers.

# CHAPTER 2

# LITERATURE REVIEW

In this study, the literature review was prepared to illustrate the main topics underlying this study. The following main topics and subtopics focused on as a result of investigating the research questions are games, games and learning, game elements, player types, gamification, gamification for professional development, teachers as designers, gamification research studies conducted with teachers, and summary of the literature. In the "Games" section, definitions and characteristics of the game, game elements and player/user types were examined. Games and learning focused implications of games on learning. Then, in the "gamification" section, the definition of gamification, purposes and area of usage, its use in education, benefit and penalties, implementation and limitation were mentioned. In the section of "gamification for professional development", the methods, models and techniques used in the professional development of teachers and the place of gamification in this context will be examined. Moreover, in the "teachers as designers", attempted the role of teachers in designing diverse learning environments. Lastly, gamification research studies conducted with teachers in the literature were examined.

## 2.1 Games

Game or play has existed throughout human history. To understand the concept of gamification and why it exists, it is necessary to examine the concept of the game, which may be called gamification's ancestor.

The game inevitably has various definitions and different characteristics following its purpose of existence. One of the earliest definitions, Huizinga (1955), who argues that games existed before the history of cultures, defines the game as a free and voluntary action that is performed in accordance with the rules. In addition, he also defines a human being as *homo ludens*, that is, as a player human.

Moreover, according to a definition proposed by two game designers, Salen and Zimmerman (2003), in the early 21st century, a game refers to a system based on certain rules in which players can attain measurable benefits within this context. Similarly, Parlett (1999), a game scholar having studied both card and board games, states that formal games have a dual nature of ends and means. Specifically, he defines ends as completing a goal and means as various elements and rules for forming a win situation.

Juul (2003), a game designer and educator, accepts a game as a rule-based system. Furthermore, he made an effort to define the game through its features. According to Juul, the game has six features:

1. Rules,
2. Variable, measurable outcome,
3. Value assigned to possible outcomes,
4. Player effort,
5. Player fixed to an outcome,
6. Debatable results

A few years later, another researcher wanted to take a narrower, minimalist approach based on Juul's work. According to Myers (2009), these six elements recommended by Juul (2003) are not equally present in all games. That is why Myers thinks that essential four attributes are enough to form a minimalist game. These four game attributes:

1. Prohibitive rules,
2. Goals

3. Opposition,
4. Representation.

The lack of a common definition of the game and the efforts of individuals to express the concept of game in different patterns have led to various opposing thoughts in the definition of game. One of the most common views is the “game cannot be defined” argument by philosopher Wittgenstein (2009) working in the field of philosophy of language. He supports this argument by making an analogy between game features and family members. He expressed the similarities and differences between the games with the concept of "family resemblances" (Wittgenstein, 2009, p. 36). According to Wittgenstein (2009), games do not have common features. Various features predominate, depending on the type of game. It would not be correct to define games as an activity that is fun, has winners and losers, and includes luck or skill. For example, while dancing game is fun, chess cannot be associated with entertainment in the first place.

As a result of the different features of the games, there are various types of games. However, there is no common classification about it. Although educators, game developers and industry use various taxonomies, Gros (2007) states that games are generally grouped under 7 categories:

1. *Action (or platform) games*, which take place based on the reaction,
2. *Adventure games*, in which players progress in the virtual world by solving various problems,
3. *Fighting games*, in which players fight against computer-controlled or real people-controlled characters,
4. *Role-playing games*, in which players take on the traits of a character,
5. *Simulations*, in which players must accomplish the objective in a system that imitates the operation of an existing or proposed system,
6. *Sports games*, which take place based on various sports,

7. *Strategy games* which occur within the framework of historical or fictional events in which players develop strategies to achieve an aim.

## 2.2 Games and Learning

Games can be used to achieve some learning outcomes. A well-developed computer or video game can provide people to create something new in a different world, become a more advanced version of themselves, and learn deeply (Gee, 2003). An example of this is using computer games to teach and learn any branch. Papastergiou, (2009) did scientific research using experimental research design and found out that game-based learning enhanced students' computer science knowledge and motivation more than non-gaming environment. Although this study took place in the context of high school, the same results can be obtained in studies conducted at different grade levels. In their research Hwang et al. (2013) investigated that effect of a concept-map embedded educational computer game on students' learning performance. They implemented game-based learning approach in a natural science course in elementary school. An experiment design applied with research tools as pre-test, post-test, and questionnaires. They found out that learning with games increased students' learning achievement, motivation, and decreased their cognitive load.

## 2.3 Game Elements

Game elements refer mannered and social elements that are unique to games (Deterding et al., 2011). However, there is no consensus in the literature on the definition and total number of the game elements. Some common examples are *badges*, *levels*, *points*, *leaderboards*, *progression*, *score*, *status*, rewards, and *roles* (Seaborn & Fels, 2015).

A systematic review stated that two most used game elements used in game-based interventions to boost health-related effects are *score* and *narrative* (Ferreira-Brito, 2019). Another study adding level, points, achievement, and rewards to improve student engagement in mathematics assessment system (WeBWorK) showed that most of the students (more than %50) engaged with the system and responded that these elements helped them reach their goals easily (Goehle, 2013).

It is necessary to intentionally incorporate game elements. Randomly selected game elements often demotivate students (Reyssier et al., 2022). Various models have emerged to implement these elements used for different purposes. Some of the most common and easily implemented elements are points, badges and leaderboards (PBLs). PBLs are extremely frequent in gamification, but they do not tell the complete story (Werbach & Hunter, 2012). A point might serve as an external indicator of progress, a badge is a visual symbol for a particular accomplishment in the experience of gaming, and a leaderboard informs participants of about position in relation to other players. (Werbach & Hunter, 2012). As Werbach and Hunter (2012) thought, if someone desires to obtain the best possible outcome of gamification, s/he ought to explore beyond PBLs. Alternative game element models have emerged in this regard.

From the perspective of three game designers, Mechanics, Dynamics, Aesthetics (MDA) Framework was developed to describe game elements for the benefit of designers as well as scholars. (Hunicke et al., 2004). MDA Framework argues that games consist of three main components: mechanics, dynamics, and aesthetics. The mechanics are core components of the game consisting of rules and include data structures. The dynamics are system of the game that formed to trigger aesthetics and shaped with attitude of players to mechanics. The aesthetics are components which make a game fun. The aesthetics elements are as follows:

1. *Sensations*, which provides pleasure,
2. *Fantasy*, which creates imaginary world,

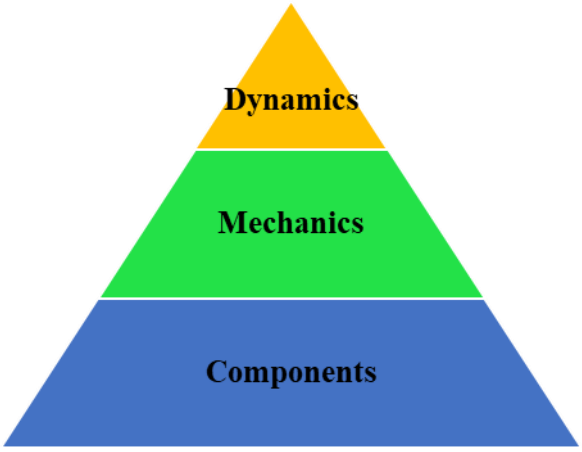
3. *Narrative*, which includes storytelling,
4. *Challenge*, which includes difficulties,
5. *Fellowship*, which provides a membership in a community,
6. *Discovery*, which consists of unexplored area,
7. *Expression*, which provides self-relation
8. *Submission*, which provides attachment to a game.

The MDA framework stated the priority order of the game components is different in the viewpoints of the designers and players (Hunicke et al., 2004). It argued that designers form the mechanics of the game and create a base for the dynamics. Then, dynamic components come and give rise to aesthetics. On the other hand, a player firstly experiences aesthetics of a game, then recognizes the dynamics and presumes mechanics.

In this study, The DMC model was selected as a framework for game elements. The DMC (Dynamics, Mechanics, Components) Model proposes that there are three types of game element in context of gamification: dynamics, mechanics, and components (Werbach & Hunter, 2012). These are in a hierarchical order based on level of abstraction (Figure 1). The most abstract element is dynamics that include constraints, emotions, narrative, progression, and relationships. The second level of hierarchy is mechanics that include challenge, chance, competition, cooperation, feedback, resource acquisition, rewards, transactions, turns, win states. The first level and the most concrete one is components that include achievements, avatars, badges, boss fights, collections, combat, content unlocking, gifting, leaderboards, levels, points, quests, social graphs, teams, and virtual goods.

**Figure 1**

*The DMC Model. Adapted from "For the Win: How Game Thinking Can Revolutionize Your Business" (Werbach & Hunter, 2012)*




## 2.4 Player Types

Player types are created from the need to categorize players according to their general game mechanic preferences (Busch et al., 2016a). The concept of player type suggests that players should be grouped based on their different characteristics such as behaviours, motivations, play styles and pleasure (Dixon, 2011). Several player types models have emerged in response to this need for personalized gameplay. According to a player's type, his/her preference for game elements such as sending a gift to a friend or choosing to play as a team tends to change. Therefore, it has become inevitable that various player type models (Bartle, 1996; Marczewski, 2015; Yee, 2006) have proposed over the years based on the motivations of the players to play the game.

Player type model by Bartle (1996) is one of the earlier ones. Bartle (2003) states that people play game to have fun, but the perception of fun can vary from person to person. He approached the player type in the context of multi-user dungeon games (MUD) in his studies (Bartle, 1996; 2003). Bartle (1996) formed a Player Interest

Graph based on four concepts: acting, interacting, people and environment. He further divides players into four categories in the context of what they perceive as fun: achievers, explorers, killers, and socializers. Achievers like acting in the world (game environment), while explorers like interacting with the world. Socializers enjoy interacting with people, while killers enjoy acting on other players. Furthermore, Bartle (1996) proposed that according to game perceptions, achievers like chess and tennis, explorers like reading and gardening, killers like hunting and fishing, and socializers like TV and concerts. However, as Bartle (2005) accepted later, his first player type model has some flaws. Firstly, the model suggests that the player type can change over time, but it cannot explain its reason. Secondly, all player types, especially "killers", have two subtypes that were unpredictable before. These flaws led to the creation of the new model and two more concepts were added to the Player Interest Graph: implicit and explicit. New model of Bartle (2005) proposes eight player types: implicit achievers as *opportunists*, explicit achievers as *planners*, implicit explorers as *scientists*, explicit explorers as *hackers*, implicit socializers as *friends*, explicit socializers as *networkers*, implicit killers as *griefers*, and explicit killers as *politicians*. Furthermore, Bartle (2005) states that this new model explains differences between subtypes but fails to explain why player types change over time. Unfortunately, Bartle's proposed model is based on his personal experiences and has not been empirically tested in his study.

Yee (2006) criticises Bartle's Player Types for not being empirically tested. Therefore, he examined Bartle's Player Types by conducting empirical research with factor analysis approach. He collected qualitative data from players of Massively Multiplayer Online Role-Playing Games (MMORPGs) to examine players' motivation. The factor analysis revealed that ten sub-components for motivation have been identified under the following three components: achievement, social, and immersion. Ten subcomponents are following: Advancement, Mechanics, Competition, Socializing, Relationship, Teamwork, Discovery, Role-play, Customization, and Escapism. Yee's empirical work showed that, contrary to what

Bartle's research suggested, the players' motivation components did not dominate each other (Yee, 2006). In other words, he proved that different player types may have the same motivation component, so grouping player types in this way may not be correct.

Another famous model is the BrainHex player-type model (Nacke et al., 2011). It was created based on neurobiological investigations and findings from the demographic game design models (Bateman et al., 2011). The BrainHex model proposes seven types of players as follows: seeker, survivor, daredevil, mastermind, conqueror, socialiser, and achiever. Dominant player types and subtypes are determined with the questionnaire in the model. To validate the BrainHex model, other researchers conducted an empirical study (Busch et al., 2016b). For this purpose, they conducted a factor analysis and found that the survey items should be revised to determine player types correctly. Therefore, they proposed that the BrainHex model should be updated.

Moreover, Player Head model was developed to categorize players based on their motivation and characteristics to play a game (Cömert & Samur, 2023). It consists of seven player types: entertainer, strategic leader, tester, artistic, researcher and socialiser. This model argues that players start the game with the same impulse, but their behavior changes after they start the game in line with their goals and preferences. At the same time, although the model was developed with a focus on games, it claims to be useful for educational games as well. On the other hand, the critical limitations of this model are that it is not the result of an experimental study and that it does not have a questionnaire that argues that it is valid and reliable.

In short, as mentioned above, although Bartle's model is still widely used, it has limitations. In addition, the model's application area is also limited as it was developed only for video games. Likewise, the BrainHex model is limited to games as it is implemented based on the video games motivations of the players. In addition,

empirical studies for the Brainhex model, such as the Bartle model, are still insufficient to validate the BrainHex model (Busch et al., 2016a; Yee, 2006).

## 2.5 Gamification

Although the term gamification has been common in the last fifteen years, it is an older approach. During this period, many definitions for gamification have appeared in the literature, but there is no consensus on a specific definition. The widely known definition of gamification is "the use of game design elements in non-game context (Deterding et al., 2011, p. 2). According to this definition, it is accepted that gamification takes place for a purpose other than the purpose of enjoyment by adding some game elements. However, some researchers argue that gamification is not simply adding game elements to a system. Huotari and Hamari (2012) consider gamification from the perspective of service marketing and define it as a process that takes place to support the value creation of the user providing the gaming experience. Also, it is widely believed that gamification consists of just using points, badges, and leaderboards. On the other hand, as some critics argued that these elements are insufficient to motivate learners and gamification is more than these elements. Fischer et al. (2016, p. 102) stated that "gamification refers to a mindset which puts motivation, engagement, and emotions at the center of the design of learning technologies and learning scenarios".

### 2.5.1 Purposes and Areas of Usage

Gamification is widely used in various fields with several purposes. It has been adopted into business to enhance employee motivation (Vinichenko et al., 1970), e-marketing to increase customer satisfaction (Noorbehbahani et al., 2019), health to raise awareness for sexual health among young people (Gabarron et al., 2013), tourism to enrich the experience of tourists and create brand awareness (Xu et al.,

2013), and human resources management to increase collaboration and provide feedback among employees (Chakraborty, 2015). These studies prove that there is no limit to the usage area of gamification. It is especially important to apply gamification in education in accordance with the purpose of this study. Therefore, the application of gamification in education will be examined separately in the next sub-title.

### 2.5.2 Gamification in Education

In accordance with the research topic of this study, the use of gamification in education has been extensively investigated throughout the literature. The main problems in today's education are students' lack of motivation and engagement to actively participate in learning activities (Kiryakova et al., 2014). According to a report, possible solutions to these problems were suggested to make the concepts taught more relevant to their daily lives, to make lessons more interesting, and to create a learning environment with more participation and feedback (Bridgeland et al., 2006). Therefore, educators try new strategies and methods to get students to participate actively in the lesson. A quasi-experimental study showed that university students were cognitively engaged and motivated after taking gamified learning activities (Huang & Hew, 2015). So, gamification seems to be born out of these needs.

In recent years, the widespread use of gamification in education has led to integration of gamification into various online learning platforms. One of the most popular is "Kahoot!". A quasi-experimental study investigated students' motivation and engagement using Kahoot in English class to learn vocabulary (Medina & Hurtado, 2017). The results showed that the learners' motivations, engagement and acquisition of vocabulary increased while they were having fun. Other examples for online gamified learning platform example are "ClassDojo" and "Edmodo". Edmodo

is a social learning network which is similar to Facebook interface developed for educational purposes (Dewi, 2014).

#### 2.5.2.1 Why Gamification Works?

The word motivation shares the same root with the word motion (Brown, 2007). In other words, motivation can be called being alive and active. Lack of motivation may be a potential problem for learners that prevents learning activities from taking place. Gamifying learning activities can encourage less motivated learners to learn actively and voluntarily (Glover, 2013). The main purpose of gamification is to increase motivation and engagement by combining intrinsic motivation with extrinsic motivation.

Because gamification's one of the main concerns is to solve the issues related motivation (Kapp, 2012), it is essential to examine the motivation theories underlying gamification. Several theories exist to explain the concept of motivation. Behaviourism, cognitivism, flow theory, self-determination theory, and positive psychology, social proof theory are common theories focusing motivation (Hamid & Kuppusamy, 2017). This study was conducted based on self-determination and flow theories as motivation approaches. A study showed that self-determination theory is the most common among the motivational theories underlying gamification (Loughrey & Broin, 2018). SDT differs from other motivational approaches because it argues that there are different types of motivation that influence behavior, where intrinsic and extrinsic motivation come into play (Ryan & Deci, 2017).

On the other hand, some studies state that gamification does not significantly affect motivation. A longitudinal study was conducted with university students using motivational, psychological, and behavioral measures (Hanus & Fox, 2015). Three game elements, leaderboards, badges, and competition were integrated into a gamified system, and participants took four surveys. The results showed that students got lower intrinsic motivation scores in the gamified system. Moreover, the

participants' class satisfaction scores, effort and learner empowerment, and exam scores in the gamified system were lower than in the non-gamified system. Another example to counter studies in the motivational aspect of gamification was a between-subjects experimental field study that implements badges as game elements into an e-learning course (Kyewski & Krämer, 2018). The research findings showed that badges did not affect learners' motivation and performance; however, they caused a decrease in learners' intrinsic motivation.

The following two subtitles include two theoretical explanations for gamification that are commonly mentioned: Self-determination Theory (SDT) and Flow Theory.

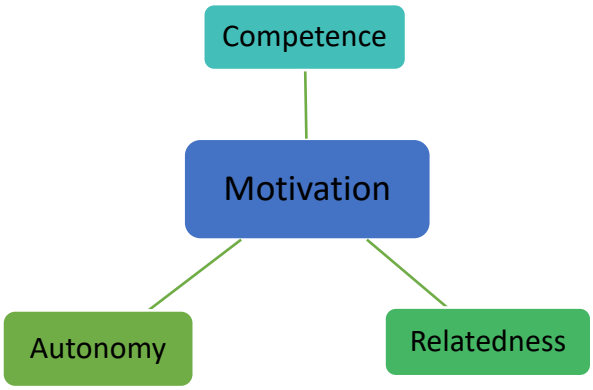
#### 2.5.2.1.1 Self Determination Theory

The self-determination theory (SDT), which is the most widely used approach, is one of many motivation theories related to gamification (Gupta & Goyal, 2022; Loughrey & Broin, 2018; Wang et al., 2021). It is a comprehensive theory that studies effect of the social conditions on human motivation and personality (Deci & Ryan, 2012). The emergence of the SDT occurred during research examining the effects of extrinsic rewards on intrinsic motivation (Deci, 1971). This study revealed that extrinsic rewards such as money decrease intrinsic motivation, whereas positive feedback such as praise increases.

Moreover, Deci and Ryan (1985) proposed that self-determination is associated with both intrinsic and extrinsic motivation. They stated that although self-determination is an inseparable part of intrinsically motivated behaviour, it can also be found in some extrinsically motivated behaviours. Fifteen years later, Deci and Ryan (2000) proposed that humans have three basic innate needs with an emphasis on intrinsic motivation: autonomy, competence, and relatedness (See Figure 2).

**Figure 2**

*Self Determination Theory*




They further argue that when these needs are satisfied, human well-being, development and performance are affected positively (Deci & Ryan, 2000). A detailed examination of these three needs is given in the following paragraph:

Firstly, autonomy is taking an eager interest in fulfilling a duty. For example, it may be concluded that autonomy is high if the learner completes a task with his/her own will and interest (Ryan et al., 2006). Secondly, competence refers to one's capability or strength to cope with one's environment (Deci, 1975). Gaining new skills beyond one's capacity or receiving positive feedback from the environment enables that person to develop competence, increasing perceived competence and intrinsic motivation (Ryan et al., 2006). Finally, the third need is relatedness which refers to a sense of belonging, and people can internalize other people's values easier if they feel connected or attached to them (Niemiec & Ryan, 2009). In today's world, the need for relatedness does not have to be met by a real person; an artificial intelligence or computer-generated character can also meet that need (Ryan et al., 2006).

In addition to all these, Deci and Ryan (2000) believe that relatedness is less dominant in intrinsic motivation compared to autonomy and competence. On the

other hand, in the classroom context, relatedness is about a student feeling respected and valued by their teacher; and if a student feel disconnected or rejected by teachers, he/she tends to make less internalization and respond more to external contingencies (Niemiec & Ryan, 2009).

Self-determination and gamification have been the subject of numerous studies in the literature. To explain how students' psychological requirements (relatedness, competence, and autonomy) modulate the impacts of gamification and learning motivation, Luarn et al. (2023) utilized the self-determination theory. Their findings indicated that important factors influencing students' intrinsic motivation are social, achievement, and immersion elements. Also, students' psychological needs may further strengthen these connections. Similarly, it was statistically proven through an experimental study based on the self-determination theory and carried out with university students that the use of challenge-based gamified learning methods boosted level of academic achievement and overall motivation (Kaya & Ercag, 2023).

Studies that provide gamification frameworks based on the self-determination theory are also available. Aparicio et al. (2012) proposed a gamification framework consisting of game elements based on self-determination theory. This framework grouped game mechanics under three self-determination concepts: autonomy, competence, and relation (as relatedness). Examples to game elements for autonomy are "profiles, avatars, macros, configurable interface, alternative activities, privacy control, notification control", for competence are "positive feedback, optimal challenge, progressive information, intuitive controls, points, levels, leaderboards" and for relation are "groups, messages, blogs, connection to social networks, chat" (Aparicio et al., 2012, p. 2).

#### 2.5.2.1.2 Flow Theory

The term flow, first introduced by Csikszentmihalyi (1975), can be described as an activity that requires great focus, a degree of difficulty that matches one's abilities, and a feeling of pleasure. Flow theory tries to answer the following question: What does it feel like to fully engage in the present moment and live fully? (Nakamura & Csikszentmihalyi, 2009). Moreover, the creative process revolves around flow, which is closely linked to the optimal experience (Biasutti, 2011).

According to Csikszentmihalyi (1990), for a person to remain in the zone of optimal experience, the activities or tasks must be demanding enough to push but not so difficult as to cause anxiety. The fundamental idea is that if a task is too simple for a person's abilities, s/he become bored; conversely, if a task is too difficult for a person's abilities, s/he become nervous. The flow zone is the point where the task's difficulty and the person's abilities are in balance.

Nine qualities of flow were established by Csikszentmihalyi (1990). These are: 1) challenge and skill balance, 2) action and awareness merging, 3) clear goals, 4) unambiguous feedback, 5) concentration on the task, 6) sense of control, 7) loss of self-consciousness, 8) Distorted sense of time, and 9) autotelic experience. It is not surprising that most of this happens while playing a good game. A study presented an experiential gaming model facilitates flow experience (Kiili, 2005). This model adopted the flow theory as a framework to promote pleasant user experience.

#### 2.5.2.1.3 Benefits of Gamification

Various studies in the literature have shown that gamification has many benefits in the context of education, especially in learner outcomes. According to Lee and Hammer (2011), gamification increases student engagement by motivating them, enables students to take an active role in their learning journey, and provides teachers with new tools to guide and reward students. Similarly, a long study over ten years

utilising game mechanics approach with a sample around 2000 students concluded that using game mechanics stimulates students to engage with learning materials (Gordon et al., 2013). According to another study, it was concluded that students' engagement and sense of accomplishment increased with the web-based homework program in which the two game elements, level, and achievement, were integrated in mathematics education (Goehle, 2013). A similar result was obtained in a study in which badges were used as game elements. It was concluded that the use of badges in the collaborative learning platform increased the engagement and motivation of the learners (Santos et al, 2013). Moreover, a study conducted with mixed-method approach revealed that flipped learning with gamification promotes students' learning performance and cognitive engagement (Lo & Hew, 2020).

#### 2.5.2.2 Pitfalls/Limitations of Gamification

While there are undoubtedly numerous benefits to implementing gamification in various fields, it is essential to acknowledge that there is also research examining its less favourable applications. According to a systematic mapping study, certain game design elements, including badges, leaderboards, contests, and points, have been frequently associated with negative consequences (Almeida et al., 2023). These undesirable outcomes encompass ineffectiveness, subpar performance, motivational issues, comprehension difficulties, and irrelevance.

Moreover, in the realm of education, some studies suggest that the incorporation of gamification does not necessarily lead to significant improvements in learner outcomes. Specifically, it has been debated that certain game elements may produce unfavourable results. Another systematic mapping study highlights that the PBL (point, badge, leaderboard) approach, when not thoughtfully integrated with appropriate instructional methods, can result in performance declines and undesirable behaviour (Toda et al., 2018). Furthermore, the competitive aspect within a gamified system may also yield negative outcomes. Research into various

competitive structures reveals that a trainee's perception of their opponent's skill level can significantly impact self-efficacy and learning outcomes; higher self-efficacy and better outcomes are observed when the trainee perceives their opponent as a lower-skill competitor (Santhanam et al., 2016). Conversely, engagement tends to be higher when facing an evenly matched competitor. In light of these findings, careful selection of gamification elements, tailored to the intended purpose, becomes crucial, as some elements may potentially hinder the desired behavioural outcomes.

However, despite the numerous benefits of gamification, it is essential to recognize the challenges it can pose to effective implementation. In today's digital age, gamification in education has predominantly taken a digital form, aligning with the pervasive presence of technology in our daily lives. Consequently, applications that integrate gamification may necessitate adequate technological support and expertise (Dicheva et al., 2015). Furthermore, the same study underscores the limited availability of controlled studies that provide conclusive evidence regarding the positive or negative impact of specific game elements in an educational context.

### 2.5.3 Gamification User Types HEXAD

Gamification User Types Hexad was first proposed by Marczewski (2015). Our study is based on the Hexad model for player types. Whereas Bartle’s player type model is applied for games, Marczewski’s model is specific to gamified systems (Marczewski, 2015). The model includes six player types as follows:

1. *Socialisers*- motivated by relatedness,
2. *Free spirits*- motivated by autonomy and self-expression,
3. *Achievers*- motivated by mastery,
4. *Philanthropist*s- motivated by purpose and meaning,
5. *Disruptors*- motivated by change,

6. *Players*- motivated by rewards.

Furthermore, Marczewski categorizes four of these types as intrinsically motivated. Intrinsic user types are philanthropists, achiever, socialisers and free spirits. Moreover, he defines players as extrinsic user types and divides player type into four subtypes as follows: self-seeker, consumer, networker, and exploiter. In addition, Marczewski describes disruptors as disruptor user types and classify them as four subtypes as follows: griefer, destroyer, influencer, and improver. Marczewki also made a suggestion on how to use these user types. He explains that there are two ways to use user types: 1) making a survey to target population to determine their types and designing for the majority type, or 2) designing a gamified environment for the types that will serve the problem to be solved.

After Marczewski's study, Tondello et al. (2016) developed a scale consisting of 24 items to specify user types for the Hexad model. This scale consists of four items for each user type. Despite the fact that experts have not yet agreed on the game features that would work best for each user type, Tondello et al. (2016) had notable outcomes in identifying user preferences for gamification based on Hexad user types. For each kind of user, they suggested a table of game design elements depending on the bivariate correlation coefficients and got a basis of Marczewski (2015) to correlate game elements. Tondello et al. (2016) presented a list of main and additional game design elements for each user type (see Table 1).

Tondello et al. (2016) stated that they found some surprising user type overlap between the Hexad user type and personality factors. It was found that some game elements are preferred for many user types. Similarly, for various user types, an element may serve diverse mechanics (Kocadere & Çağlar, 2018). In future research, Tondello et al. (2016) also wanted to further understand the impact of the philanthropist user type, which their study did not disclose, on user preference for gamified systems.

**Table 1**

*User types and corresponding game elements (Tondello et al,. 2016)*

| User Type | Main Game Elements | Additional Elements |
|---|---|---|
| Philanthropist | - | - |
| Socialiser | Guilds or Teams, Social Networks, Social Comparison, Social Competition, Social Discovery | - |
| Free spirit | Exploratory Tasks, Nonlinear Gameplay, Easter Eggs, Unlockable Content, Learning, Anonymity Anarchic Gameplay | Customization, Challenges, Creativity Tools, |
| Achiever | Challenges, Certificates, Quests | Anonymity, Learning, Badges or Achievement, Levels or Progression |
| Disruptor | Innovation Platforms, Voting Mechanisms, Development Tools, Creativity Tools | Social Competition, Anarchic Gameplay, Challenges |
| Player | Points, Rewards or Prizes Leaderboards, Badges or Achievements, Virtual Economy Levels or Progression Collection, and Trading | Social Comparison, Social Competition, Social Discovery, Anonymity Challenges, Certificates, Quests |

In order to validate the Hexad scale, Tondello et al. (2016) investigated internal reliability, test-retest reliability, and applied factor analyses. According to the results, it is a suitable scale to measure user preference in gamification. A few years later they updated the scale, suggesting that the most common types of users were Philanthropist, Free Spirit, and Achiever, with Disruptor being the least common (Tondello et al., 2019). Moreover, they validated the scale in both English and Spanish languages.

In this study, a version of Hexad scale adapted to Turkish language was used (Taskin & Kiliç Çakmak, 2020). The authors conducted a study with 330 university students in order to confirm the reliability and validity of the scale. The confirmatory factor analysis revealed that fit indices were appropriate. Also, they found that the scale is reliable as the Cronbach's alpha coefficients varies between 0.615 and 0.759. As a result, they suggested to implement the scale to specify user types in gamification.

#### 2.5.3.1 Effect of Player/User Types on Relevant Variables

In gamified environments, the users' player type influences different variables such as behavior, performance, motivation, and perception of game elements. In a gamified learning environment, students with diverse player kinds displayed various behaviors and degrees of performance (Barata et al., 2017). Likewise, the findings of a gamification case study with a randomized controlled experiment showed that players' perception of game elements and performance in the gamified application are correlated with their user type (Lopez & Tucker, 2019). It is also claimed that the impact of player types on performance is positive. The same study's results demonstrated that people who interacted with the gamified program outperformed those who interacted with the non-gamified application only after adjusting for player type.

Whether this effect is positive or negative is a matter of debate. Many studies in the literature assert that it affects these outcomes positively (Ortiz-Rojas et al., 2019).

For more specific pinpoint, it was examined whether assigning students to different customised versions depending on their user types had a higher impact on their engagement than randomly assigning them to different versions (Mora et al., 2018). According to the findings regarding behavioural engagement, 73.34% of all the students that participated in the game-based learning experience through their user type were engaged, indicating that they took part in minimum one task.

The above studies are just a few examples of the impact of user types on performance, motivation, and engagement. As it can be seen, adapting user types into a gamified system has created a positive impact on various purposes. In addition to these, there are also studies claiming that it has no effect. The findings of one of these studies, an experimental study, revealed that the students' performance in learning was not influenced by the player-type oriented gamified mobile application (Ugur-Erdogmus & Çakır, 2022). In addition to this, another study revealed that the motivation of the various player types did not statistically differ from one another (Park et al., 2021). Furthermore, there were no significant difference between the four player types identified by Bartle in terms of their material comprehension, or enjoyment.

## 2.6 Gamification for Professional Development

Teacher education is a type of education that needs to be constantly changed according to the needs of the era. The simplest reason for this is that the people the teachers interact, namely the students, are in change. It is obvious that the expectations and learning types of the generation y students and the generation z students from education are different. Therefore, teachers should be trained to meet these expectations. Gamifying teachers' professional development ought to have a more extensive focus, with the aim of enhancing teachers' motivation to apply newly acquired knowledge and approaches in their everyday teaching (Pozzi et al., 2016).

As teacher education is a dynamic field, approaches, and methods in teacher education change over time. One effective way to help university teachers develop their skills is through gamification, which is used in consultations and deployed as a pedagogical technology by consultants from the same educational institution to enhance university professors' ongoing education processes (Lukashenia et al., 2020). Middle school teachers participated in an action research study that focused on the use of gamification as a tool for pedagogical sharing and teachers' professional development (Greaves & Vlachopoulos, 2023). Prior to and during the activities, the teachers completed a survey. The findings showed that although the gamified professional development activity had certain motivational drawbacks that didn't resonate with every teacher, it did encourage pedagogic sharing among the majority of participants. Moreover, one notable advantage is its integration into the regular workday and week, allowing teachers to share practices without disrupting their teaching and learning. In other words, gamified professional development empowers teachers to drive their own pedagogic development, unlike traditional workshops that require more centralized planning and logistical support.

## 2.7 Teachers as Instructional Designers

Teachers are seen as far from the role of designers of instructional materials, but rather as users of materials produced by others (Kaur et al., 2022). However, teachers can play roles as designers by preparing gamified content themselves as well as choosing to adapt the ready-made content to the courses. Due to this effect, various studies have emerged exploring teachers' role as designers. Kirschner (2015) declared that "teachers are designers— of all learning, including TEL" (technology-enhanced learning) (p. 320). He also stated that the research of teachers as designers of technology-enhanced learning is very young. Furthermore, according to Kirschner (2015), teachers should be capable in three areas to be competent designers. These are: i) subject domain, ii) learning science, and pedagogy, and iii) research and design science.

In order to provide the competencies Kirschner (2015) mentioned above, teachers can get help from technology. To assist teachers as designers, design-based research was carried out and developed an online design platform named Learning Designer (Laurillard et al., 2018). This tool gave rise to a community of K-12 teachers and allowed teachers to learn and share about learning design collaboratively. To get insights about the implementation of this tool, participants completed the pre-test ($n$=133) and post-test ($n$=55) survey, and some created blog posts ($n$=84) about the tool. According to inductive thematic analysis of the qualitative and quantitative data, it was found that the platform encouraged teachers to collaborate and peer reviews, increased their self-esteem, and thus, made a significant contribution to teacher professional development in technology enhanced learning.

The position of teachers as designers is also a matter of debate. A cross-case study was conducted to explore the different designer roles in developing and adapting technology-rich learning materials (Cviko et al., 2014). A pre-test post-test quasi-experimental design was conducted. This study consisted of three cases in which teachers took different designer roles: executor-only, re-designer, and co-designer. In the case where the teachers were in the executor-only position, the teachers applied ready-made materials. Teachers in the re-designer role collaboratively redesigned and implemented existing activities, while teachers in the co-designer role designed and implemented new activities. According to the findings, each teachers' role contributes to the impact of technology-enabled activities, as student learning outcomes are significant in both the experimental and control groups. On the other hand, the extent of integration of materials differs from the roles of co-designer, re-designer, and executor-only. Co-designers were the greatest extent, while executor only was the lowest.

Unlike the studies mentioned above, several studies in which teachers acted as game designers were also conducted. Nordby and Nordseth (2016) conducted a research project to investigate whether primary school teachers with no previous experience can gamify their own teaching. They found that teachers were able to design and

develop their own games and their students enjoyed them. Similar to this study, Arnab et al. (2019) thought that teachers can be game designers and performed a case study involving forty-three teachers who developed a total of eighteen games. These games were tested in the schools and both teachers and students' feedback were positive. Teachers stated that designing games motivated them, as well as provided brainstorming and sharing ideas.

## 2.8 Gamification Research Studies Conducted with Teachers

When the current literature was examined, it was seen that teachers are one of target groups in gamification studies to investigate various factors. As the purpose of this study is to research teachers' characteristics (player type, gender, branches, etc.) in the gamification context, the studies whose target group is directly or partially teachers were crucial for this research. Moreover, when the current studies were investigated, it is clear that many studies have been carried out with pre-service teachers in addition to in-service teachers.

One of the most frequently researched topics is teachers' gamification adoptions. An example of the recent studies carried out for this purpose investigated how the gamified online course affected pre-service teachers' motivation to adopt technology for teaching (Wu et al., 2023). For this purpose, eighty-four students in the United States participated in the study and took a survey consisting of a 5-point Likert scale. Then a series of multiple regression was applied. It was revealed that there was a strong correlation (.53, $p < 0.001$) between the gamified course and pre-service teachers' motivation to adopt gamification. Also, the results showed that gender did not make a difference in teachers' motivation to adopt gamification. Similar to this study, a study was conducted with pre-service English language teachers through narrative interviews to investigate perceptions of online teaching practices, including gamification, during the pandemic process (Cruz & Medina, 2021). The participants' perceptions were quite positive, and they stated that gamification provides the most

appropriate activities for online teaching. Also, the teachers declared that gamified activities triggered collaborative learning and motivated students.

Similar to the studies above, a study was carried out to investigate adoption of gamification by teachers (Laskowski & Borys, 2016). The main purpose of this study was to investigate academic teachers' adoption of gamification and serious games in higher education. For that purpose, thirty-four teachers completed a two-part survey, one investigating the gamification and other investigating the serious games dimension. According to the responses to the survey, all the teachers stated that they use gamification in their classes to increase student motivation. Also, the second most mentioned reason to adopt gamification is to make courses more attractive. However, the teachers also stated that the reason for not using gamification is having no time to prepare gamified course.

Investigation of teachers' purposes for using gamification is another type of study in which teachers are involved. Another study was conducted with the participation of e-learning or gamification experts in the online survey (Rebelo & Isaías, 2020). In this study, 36% of the participants were teachers. 98% of respondents stated that gamification could be used to increase engagement on e-learning websites. This study also shed light on the game element preferences of teachers. The participants noted that the most effective gamification elements used in e-learning websites are questions and challenges, levels, and progress bars, respectively. As a result, a positive correlation was found between the utilization of gamification tools and the extent of users' participation in an e-learning website.

In their study, Jassem and Piskadło (2015) conducted research with both teachers and students in order to prove that game elements can be used to make an impact in the lessons. In the experimental phase with teachers, firstly, 21 mathematics teachers participated in a workshop focusing on the theoretical dimension of gamification. Later, moving on to the more practical part of the workshop, the teachers worked in groups to create gamified lessons. After the workshop was completed, the teachers

filled out a web-based evaluation form. 87% of the participants expressed interest in using gamification in their classrooms, and 100% of them planned to participate in a future gamification workshop session. According to their answers, teachers were willing to implement gamification in their lessons if they could find suitable tools for gamified learning activities.

## 2.9 Summary of the Literature

Determining the gamification player types of in-service teachers and determining their game element preferences will help close a gap in the literature. With personalized gamification, users get a gamified learning experience with game mechanics suitable for their type. Although there are many models related to the User type, Hexad is a type specially produced for gamification, so in this study, Hexad scale is used as a basis for determining the types of teachers. Although there are many studies on gamification in the literature, they generally revolve around pre-service teachers. There is no study focusing on the player types of in-service teachers. In order to fill this gap in the literature, the current study aimed to determine the gamification user types of in-service teachers and in addition, collects their game element preferences.

While the literature extensively covers the benefits and applications of gamification, there is a glaring lack of research focusing on in-service teachers as the target audience. Existing studies mainly concentrate on pre-service teachers, overlooking the professional development needs of in-service educators. Given the increasing emphasis on personalized gamification, user-player typologies have gained prominence in recent years for tailoring experiences. Among these typologies, the Hexad Scale, crafted explicitly for gamification, outlines six user types, each serving as a unique wellspring of motivation. Additionally, the study acknowledges the significance of game elements, with models like PBL, MDA, and DMC defining these components. Notably, point, badges and leaderboards (PBLS) receive the most

attention within the literature. By bridging these gaps in research, our study endeavors to advance our understanding of gamification's potential for in-service teacher training and development.

# CHAPTER 3

# METHODOLOGY

In this chapter, the research methodology is examined in detail. It includes research questions, overall design of the study, participants, data collection instruments, implementation, data analysis, validity, and reliability.

## 3.1 Research Questions

The primary purpose of this study is to determine the gamification player types of in-service teachers in Turkey. In addition, it also aims to determine whether the player types of the teachers differ by age, gender, level, and branch. Furthermore, the study aims to reveal teachers' preferred game elements for designing gamification and relationship between teachers' player types and their preferred game elements. In line with the purposes of the study, this study will address the following research questions:

**1)** What are teachers' player types?

> **1.1)** Do player types differ by teachers' demographics (age, gender, grade level, and branch)?

**2)** Which game elements do teachers prefer for gamification design?

**3)** What is the relationship between teachers' gamification user types and their preferred game elements for gamification design?

## 3.2 Overall Design of the Study

This study pursues three goals: i) to identify the gamification user types of in-service teachers, ii) to investigate whether the user types differ by subject, age, gender, and grade level, and iii) . To achieve this aim, *quantitative research* was conducted as a research method. The focus of quantitative research is primarily on numbers (Fraenkel & Wallen, 2008). Moreover, quantitative researchers look for and try to explain the causes of these relationships as well as build links between variables. Descriptive, causal-comparative and correlational research methods were suitable for the purpose of the current research. Descriptive studies explain a specific situation and current conditions through research without examining correlations between variables (Fraenkel & Wallen, 2008). Causal comparative research is a sort of associational study that evaluates the link between variables without manipulating them. Moreover, the fundamental causal-comparative design entails the selection of two groups that exhibit variations in a specific variable of concern, followed by a comparison of these groups regarding one or more additional variables. Fraenkel and Wallen (2008) stated that there are three types of causal-comparative research: exploration of effects, exploration of causes, and exploration of the consequences. This paper examines the association between gamification user type and other independent variables, including age, gender, grade level, and branch. Therefore, the causal-comparative type in this study is "exploration of effects (dependent variable) caused by a membership in a given group" (Fraenkel & Wallen, 2008, p. 364). In that regard, it is reasonable to anticipate that gamification user types of teachers might differ by their demographics. Furthermore, correlational research method was conducted to investigate relationships between variables. Correlational research is one of the associational research types (Fraenkel et al., 2012). Associational study examines the relationship between variables without being manipulated. Specifically, point biserial correlation was applied. The calculation and interpretation of a biserial correlation coefficient are identical to those of a Pearson

r coefficient when data on a variable that is presumed to be quantitative are split into two categories (Fraenkel et al., 2012).

The current study has some main steps as selecting a problem, choosing a sample, choosing instruments and specifying procedure (Fraenkel et al., 2012). These stages are briefly explained here. (For detailed information, see the relevant sections.) In this study, first, the research problem and then the research questions were determined. These were mentioned in the previous section. Purposive and convenience sampling, which are non-probability sampling types, were used. In the study, HEXAD scale was implemented to determine teachers' player types. The instrument consisted of two sections that administered in a single session. It was opened to the access of the participants online, and a certain time was given for them to answer. After specific time the data was collected, and data analysis was performed. Data analysis took place via IBM SPSS Statistics 29. Then the main results and limitations are presented and discussed.

## 3.3 Population, Sampling and Participants

All in-service teachers working in public schools under the Ministry of National Education in Turkey are the population. According to the data of "National Education Statistics-Formal Education 2021-2022", there are 687,224 elementary school teachers working in public and private schools in Turkey. Of those, 407,909 work in public schools.

An eclectic approach was preferred for sampling. This study employed a two-stage sampling strategy, incorporating non-probability sampling techniques, namely purposive and convenience sampling. First of all, participants of the Digital Teachers Project were purposively selected to reach teachers from different parts of Turkey. Convenience sampling was used to select those who took part in three different terms. While the participants can be defined as purposive in terms of being chosen

intentionally as they meet certain criteria, it is also considered as convenience sampling in terms of the availability and willingness to participate.

Moreover, there might be a bias in the selected sample of teachers, since are selected from the in-service teachers who had applied to the Digital Teachers Project with an intent to enhance their digital skills. The Digital Teachers Project is a free training program funded by Turkey branch of ING Bank. It is designed and conducted by the professors and trainers with PhD from Middle East Technical University (METU), along with a non-governmental organization namely, Habitat Association's support for logistics and organization. The three partners started to working on the main framework of the project as of July 6, 2020, with the main objective of "contributing to digital transformation in education by increasing and improving the digital competencies of teachers who have difficulties in using digital technologies in their classes, especially in the course of the emergency remote education" during COVID 19 epidemic (Kaplan, Çağıltay, Kara Aydemir, Çelik, & Tunga, 2022). Thus, it is possible that these teachers, as participants to the project, were already highly motivated since they were expecting to acquire skills in designing and developing educational content by integrating technology. Therefore, these participants also play a significant role as teacher-designers, whose preferences may serve as an indicator to develop such gamification environments to cater to these preferences in the future.

The initial total number of participants was 1961. However, the number of valid responses to measurement instrument was 1915. The criterion for an invalid response is as follows: Any instance where participants selected either "1" or "7" for all items, or left the items blank. The sensitivity of ANOVA and MANOVA to outliers is one of their more significant drawbacks (Tabachnick & Fidell, 2007). Therefore, 41 multivariate outliers were detected, so they were excluded. Outliers were located with Mahalanobis distance and removed from the data because there are no multivariate outliers in MANOVA assumptions (Tabachnick & Fidell, 2007). Finally, the total sample was 1874 in-service teachers. Of the participants, 1576 were female (84.1%), and 298 were male (15.9%).

**Table 2**

*Distribution of participants by gender*

| Gender | n | % |
|---|---|---|
| Female | 1576 | 84.1 |
| Male | 298 | 15.9 |

The participants were from different regions of Turkey. In total, there was participation from 32 cities. The majority of the participants were from İstanbul (n=527, 28.1%) and Ankara (n=515, 27.5%). Followed by İzmir (n=148, 7.9%), Adana (n=131, 7.0%), and Antalya (n=93, 5.0%). The Table 3 below shows the ten cities with the highest number of participants.

**Table 3**

*Ten cities with the highest number of participants*

| City | n | % |
|---|---|---|
| İstanbul | 527 | 28.1 |
| Ankara | 515 | 27.5 |
| İzmir | 148 | 7.9 |
| Adana | 131 | 7.0 |
| Antalya | 93 | 5.0 |
| Bursa | 70 | 3.7 |
| Gaziantep | 60 | 3.2 |
| Konya | 48 | 2.6 |
| Mersin | 38 | 2.0 |
| Diyarbakır | 35 | 1.9 |

The participants belonged to different age categories ($M$= 41.31, $SD$= 7.15). The youngest teachers' age was 24 and the oldest was 66. Age categories were formed as

"24-33", "34-43" and "44-66". Table 4 shows that the "34-43" age category has the highest number of participants (n=813), followed by the "44-66" age category (n=540). On the other hand, the 24-33 age category has the lowest number of participants (n=214).

**Table 4**

*Teachers' age categories*

| Age categories | n | % |
|---|---|---|
| 24-33 | 214 | 13.7 |
| 34-43 | 813 | 51.9 |
| 44-66 | 540 | 34.5 |
| Total | 1567 | 100 |

The teachers were from diverse branches such as classroom teacher, mathematics, science, English, technology and design, Turkish language, foreign language, physical education, guidance, religious culture and moral knowledge. When the teachers were categorized according to their branches, it was seen that the classroom teachers were the highest in number, with English, science, and mathematics teachers in close pursuit. As seen in the Table 5, the remaining branches were grouped together in a single category

**Table 5**

*Teachers' branches*

| Branch | n | % |
|---|---|---|
| Classroom | 1005 | 53.6 |
| English | 168 | 9.0 |
| Science | 151 | 8.1 |
| Mathematics | 122 | 6.5 |
| Others | 428 | 22.8 |
| Total | 1874 | 100 |

Teachers were working at different grade levels consisting of primary, elementary, and mixed (Table 6). It was seen that the majority of them were primary classroom teachers (n=1122, 60.2%).

**Table 6**

*Teachers' grade levels*

| Grade levels | n | % |
|---|---|---|
| Primary | 1122 | 60.2 |
| Elementary | 693 | 37.2 |
| Mixed | 50 | 2.7 |
| Total | 1865 | 100 |

## 3.4 Measurement Instruments

Quantitative data were collected in line with the aims of the study. Since the main purpose is to determine the gamification user types of pre-service teachers, it was decided that the HEXAD scale was suitable for this purpose. As a result, measurement instrument consists of 3 parts: 1) gamification user type scale, 2) game element survey, and 3) demographic form.

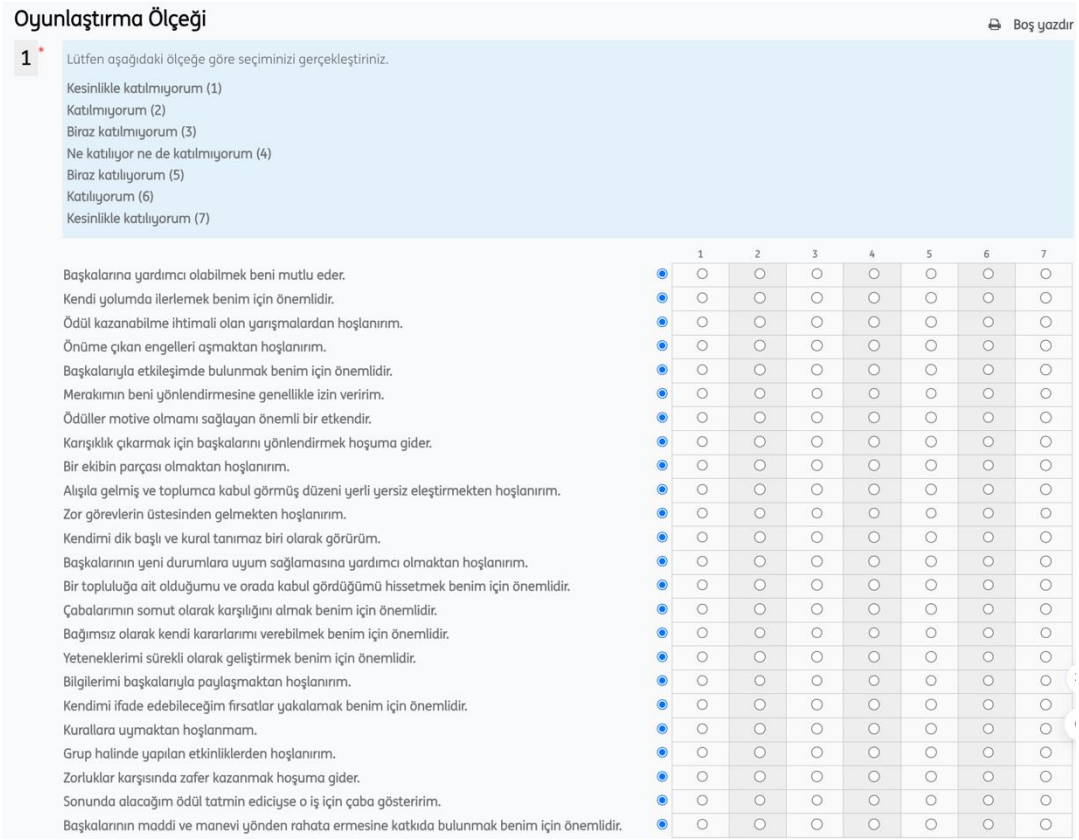
### 3.4.1 Gamification User Type Scale (Hexad Scale)

The Gamification User Types Hexad Scale aims to determine gamification user types developed by Marczewski (2015). Then the scale was updated by Tondello et al. (2016). As mentioned in Chapter 2 earlier, the scale is the 7-point Likert-type scale (from strongly disagree: "1", to strongly agree: "7") which has 24 items based on six motivational factors (see Figure 3). Specifically, the user types are determined by the various motivations of users influenced by both intrinsic and extrinsic factors. The

three intrinsic motivational categories from the Self Determination Theory—relatedness, competence, and autonomy—were combined with purpose to create the Hexad model.

**Figure 3**

*The screenshot of the Gamification User Types Hexad Scale.*




### 3.4.2 Game Element Survey

In this study, game elements were taken from the DMC Model and MDA framework. 12 of them were taken directly from the DMC model (see Table 7) besides the most commonly employed ones. In order to determine the users' game element preferences, the participants were asked to choose the 5 elements (out of 17 elements) that they would prefer the most to use for gamification in their future

lessons. What is more, all of the elements were given to teachers along with their short descriptions to make sure that they are easily understood (see Figure 4).

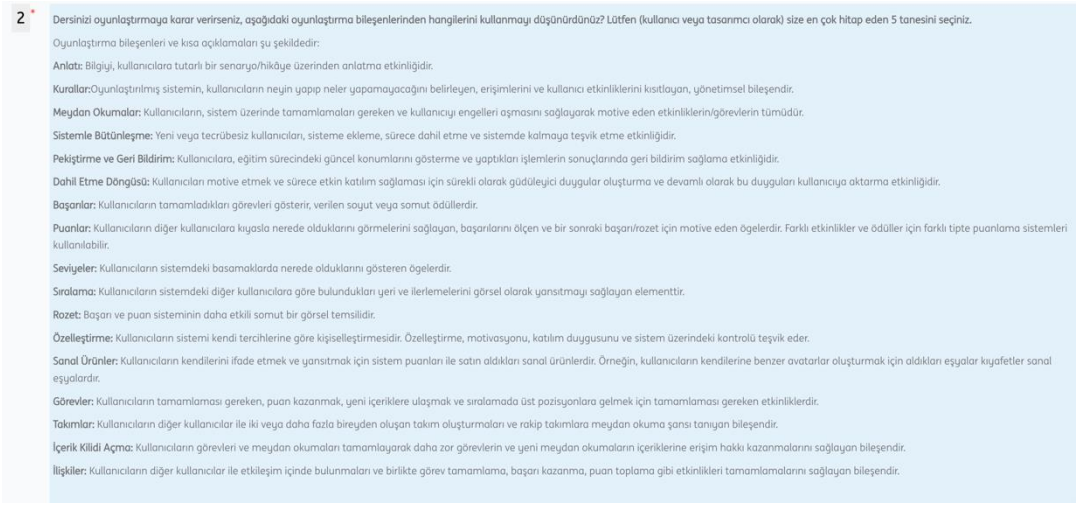
**Table 7**

*Game elements adapted from the DMC Model*

| Dynamics | Mechanics | Components |
|---|---|---|
| Narrative | Challenges | Achievements |
| Relationships | Feedback and reinforcement | Levels |
| | | Points |
| | | Ranking/Leaderboard |
| | | Badges |
| | | Virtual Goods |
| | | Teams |
| | | Content Unlocking |

**Figure 4**

*The screenshot of the game elements along with their descriptions as presented in the game element survey.*


2 *

Dersinizi oyunlaştırmaya karar verirseniz, aşağıdaki oyunlaştırma bileşenlerinden hangilerini kullanmayı düşünürdünüz? Lütfen (kullanıcı veya tasarımcı olarak) size en çok hitap eden 5 tanesini seçiniz.

Oyunlaştırma bileşenleri ve kısa açıklamaları şu şekildedir:

**Anlatı:** Bilgiyi, kullanıcılara tutarlı bir senaryo/hikâye üzerinden anlatma etkinliğidir.

**Kurallar:**Oyunlaştırılmış sistemin, kullanıcıların neyin yapıp neler yapamayacağını belirleyen, erişimlerini ve kullanıcı etkinliklerini kısıtlayan, yönetimsel bileşendir.

**Meydan Okumalar:** Kullanıcıların, sistem üzerinde tamamlamaları gereken ve kullanıcıyı engelleri aşmasını sağlayarak motive eden etkinliklerin/görevlerin tümüdür.

**Sistemle Bütünleşme:** Yeni veya tecrübesiz kullanıcıları, sisteme ekleme, sürece dahil etme ve sistemde kalmaya teşvik etme etkinliğidir.

**Pekiştirme ve Geri Bildirim:** Kullanıcılara, eğitim sürecindeki güncel konumlarını gösterme ve yaptıkları işlemlerin sonuçlarında geri bildirim sağlama etkinliğidir.

**Dahil Etme Döngüsü:** Kullanıcıları motive etmek ve sürece etkin katılım sağlaması için sürekli olarak güdüleyici duygular oluşturma ve devamlı olarak bu duyguları kullanıcıya aktarma etkinliğidir.

**Başarılar:** Kullanıcıların tamamladıkları görevleri gösterir, verilen soyut veya somut ödüllerdir.

**Puanlar:** Kullanıcıların diğer kullanıcılara kıyasla nerede olduklarını görmelerini sağlayan, başarılarını ölçen ve bir sonraki başarı/rozet için motive eden ögelerdir. Farklı etkinlikler ve ödüller için farklı tipte puanlama sistemleri kullanılabilir.

**Seviyeler:** Kullanıcıların sistemdeki basamaklarda nerede olduklarını gösteren ögelerdir.

**Sıralama:** Kullanıcıların sistemdeki diğer kullanıcılara göre bulundukları yeri ve ilerlemelerini görsel olarak yansıtmayı sağlayan elementtir.

**Rozet:** Başarı ve puan sisteminin daha etkili somut bir görsel temsilidir.

**Özelleştirme:** Kullanıcıların sistemi kendi tercihlerine göre kişiselleştirmesidir. Özelleştirme, motivasyonu, katılım duygusunu ve sistem üzerindeki kontrolü teşvik eder.

**Sanal Ürünler:** Kullanıcıların kendilerini ifade etmek ve yansıtmak için sistem puanları ile satın aldıkları sanal ürünlerdir. Örneğin, kullanıcıların kendilerine benzer avatarlar oluşturmak için aldıkları eşyalar kıyafetler sanal eşyalardır.

**Görevler:** Kullanıcıların tamamlaması gereken, puan kazanmak, yeni içeriklere ulaşmak ve sıralamada üst pozisyonlara gelmek için tamamlaması gereken etkinliklerdir.

**Takımlar:** Kullanıcıların diğer kullanıcılar ile iki veya daha fazla bireyden oluşan takım oluşturmaları ve rakip takımlara meydan okuma şansı tanıyan bileşendir.

**İçerik Kilidi Açma:** Kullanıcıların görevleri ve meydan okumaları tamamlayarak daha zor görevlerin ve yeni meydan okumaların içeriklerine erişim hakkı kazanmalarını sağlayan bileşendir.

**İlişkiler:** Kullanıcıların diğer kullanıcılar ile etkileşim içinde bulunmaları ve birlikte görev tamamlama, başarı kazanma, puan toplama gibi etkinlikleri tamamlamalarını sağlayan bileşendir.

### 3.4.3 Demographic Form

The demographic form was used to present gamification user types and game element preferences of in-service teachers based on the teachers' characteristics. Specifically, the grade level, branch, age, and gender information in the form were examined in this study.

## 3.5 The Context of the Study

The participants of this study consisted of teachers who participated in The Digital Teachers Project. The Digital Teachers Project was launched in July 2020 to develop and reinforce the digital competencies of primary and elementary school teachers in Turkey (Kaplan et al., 2022). The project adopted "learning by doing" approach, which teachers receive training to improve themselves and complete various

assignments. The project consists of two phases: the first phase consists of ten weeks, and the second phase consists of two weeks. In the first phase, participants take asynchronous and synchronous courses on various topics, such as digital citizenship, creativity, and visual design, prepared by experts in the field. For the evaluation process, knowledge tests or practical assignments were used. When the first phase was completed, the teachers went through a qualifying process to be able to move on to the second phase. They were ranked according to the score they achieved at the end of the first phase, and 105 teachers qualified for the second phase. In the second phase, the main training topic was virtual and augmented reality in education. At the conclusion of the project, the teachers are anticipated to collaboratively create a 3D virtual environment representing a school subject within the curriculum

The Digital Teacher Project has received positive feedback from the participants. According to the surveys conducted at the end of the first two terms, teachers stated that this training provided the best contribution to them (Kaplan et al., 2022). The project is currently starting its 7th term.

### 3.6 Validity and Reliability

A Cronbach's alpha score of 0.7 or higher is regarded good, indicating that the scale is internally consistent (Nunnally & Bernstein, 1994). The reliability of the original Hexad scale can be measured by calculating Cronbach's alpha for each subscale (Tondello et al., 2019). After evaluating the internal reliability of each subscale, the researchers found that the free spirit subscale had a reliability of .596, which is below the desired level of 0.70. On the other hand, achiever (.711), disruptor (.700), philanthropist (.704), socialiser (.788), and player (.748) subscales have a reliability higher than 0.70.

Researchers attempted to adapt the Hexad scale of Tondello et al. (2019) into Turkish language (Taskin & Kiliç Çakmak, 2020). Based on data from 330 individuals, investigators used Confirmatory factor analysis to confirm that the expected model

of the scale fits well with the actual model. The reliability of the Hexad scale adapted to Turkish has been assessed, and it was seen that the Cronbach alpha values of the factors range between .615 and .759. Moreover, one factor representing free-spirit user type in the scale is .615 which is less than .7. On the other hand, in the original language of the scale, this value is even lower (.596) as mentioned above.

Although previously the reliability values were found as stated above (ranging between .615 and .759), this study re-examined the Cronbach alpha value for reliability. As seen in Table 8, Cronbach alpha equals to .792 for items representing philanthropist, .758 for free-spirit, .769 for player, .824 for achiever, .786 for socialiser, and .684 for disruptor in the HEXAD scale Turkish version. Overall Cronbach alpha value was found .843, which represents a good reliability.

**Table 8**

*Cronbach alpha values for Turkish Hexad Scale*

| Items | *n* | Cronbach alpha |
|---|---|---|
| Philanthropist | 4 | .792 |
| Free spirit | 4 | .758 |
| Player | 4 | .769 |
| Achiever | 4 | .824 |
| Socialiser | 4 | .786 |
| Disruptor | 4 | .684 |
| Overall | 24 | .843 |

Furthermore, for the second section of the measurement instrument, expert opinion was obtained for game elements.

Internal validity is the condition where observed differences on the dependent variable may be explained by the independent variable alone and not by any other undesirable factor (Fraenkel & Wallen, 2008). The potential threat posed by a subject

characteristic poses the biggest risk to the internal validity of a causal comparative investigation. The subject characteristics threat was eliminated because all groups have similar characteristics, they are all in service teachers and have similar characteristics to be selected for the same project, Digital Teachers Project. The fact that the location is different for each participant poses a danger. The location threat was overcome as follows: The scale is accessed via the online learning platform and the participants were advised to take the scale in a comfortable environment. In this way, the participants were not restricted in a certain location, and they were allowed to participate from their own comfort zones. The instrument is used only once, so instrument decay cannot be a threat. In addition, data collection characteristics and data collector bias are not threats because the participants do not communicate with the data collector, they access and respond to the instrument online. Another one, testing threat occurs when the responses given to the first instrument affect the second instrument. On the other hand, in this work there is only one instrument consisting of two parts. In the second part of the instrument, there are no items that can be associated with the first part. Therefore, testing threat can be minimized as participants will not be able to try to make their answers in the second part compatible with the first part. Mortality threat is under control because subjects completed the instrument in a single session.

## 3.7 Data Collection Procedures

Before beginning this investigation, permission was acquired from the Middle East Technical University Human Subjects Ethics Committee. Appendix includes the approval document.

Before using the measurement devices, a small pilot research was carried out with university students or graduates. The researcher presented the measurement items to these participants and inquired if there were any aspects that were unclear or not comprehensible to them. Once it was confirmed that the learners had no issues based

on their responses, measurement instrument was placed on the Digital Teacher Project online learning platform. Additionally, demographic information was collected through this platform. An explanation for these actions is provided in the subsequent paragraph:

The data for this study was collected over three distinct time periods: June 2021, January 2022, and June 2022. Different sets of participants were involved during each of these timeframes. Since the participants acquired the instrument online, they were not limited by time and place. On the other hand, the instrument was on the platform for a limited time.

## 3.8 Data Analysis

The data for this study was initially obtained by downloading it from the Digital Teacher Project online platform. Subsequently, it was imported into IBM Statistical Package for Social Sciences (SPSS) Version 29. The analysis focused on the valid responses provided by 1874 in-service teachers using the measurement instrument.

The scores obtained from the gamification user type scale was summed and total scores were used in the analyses.

Internal consistency of the gamification user type scale was determined using Cronbach's alpha (Cronbach, 1951) to assure reliability. Overall Cronbach alpha value was found as .843.

IBM SPSS was employed for conducting descriptive and inferential statistics on quantitative data in order to answer the study's research questions. To be more specific, descriptive statistics (mean, standard deviation, and frequencies) were used to answer the RQ1 and RQ2. Additionally, to address RQ 1.1, a one-way multivariate analysis of variance (MANOVA) was used to examine whether gamification user types differ by teachers' demographics. Before carrying out MANOVA, its assumptions were tested.

In order to assess multivariate normality, Mardia's test was used (Mardia, 1970). The test produced a significant result ($p < .05$). For this reason, multivariate normality could not be achieved. However, MANOVA is robust to diversions from multivariate normality. Although MANOVA systems include various multivariate statistics for testing the significance of main effects and interactions, including Wilks' lambda, Hotelling's trace criterion, Pillai's criterion, and Roy's greatest characteristic root criterion; Pillai's criterion is thought to be stronger than the others (Olson, 1979; Tabachnick & Fidell, 2007). Multicollinearity was checked through performing Pearson's correlation analysis between the dependent variables. All correlation values were less than .75. Thereby, there was no multicollinearity in the data.

Box's M test was used to check equality of covariance matrices. Except for age ($p > .05$), Box's M test was significant for gender, grade level, and branch ($p < .05$). Therefore, the assumption was violated. As a result, Pillai's trace was used in all analyses as the robust choice (Tabachnick & Fidell, 2007).

In order to examine which groups differ, a one-way ANOVA with Bonferroni correction was conducted. Before carrying out ANOVA, its assumptions were tested. In order to assess univariate normality, the skewness and kurtosis values were checked. As seen in Table 9, the skewness and kurtosis values of philanthropist dimension was -1.56 and 3.00, free spirit was -1.43 and 2.64, player was -0.67 and 0.32, socialiser was -0.99 and 0.78, achiever was -1.25 and 1.63, and disruptor was 0.63 and -0.27. Based on these values, univariate normality was achieved.

**Table 9**

*Skewness and Kurtosis Values of Dimensions*

| Dimension | Skewness | Kurtosis |
|---|---|---|
| Philanthropist | -1.56 | 3.00 |
| Free spirit | -1.43 | 2.64 |
| Player | -0.67 | 0.32 |
| Socialiser | -0.99 | 0.78 |
| Achiever | -1.25 | 1.63 |
| Disruptor | 0.63 | -0.27 |

The assumption of homogeneity of variances was checked using Levene statistic. All variables met this assumption ($p >$. 05), except for the socializer user type under branch ($p <$ .05). For this reason, Welch's ANOVA and Games-Howell post hoc test used for the socializer user type under branch. For others, Scheffe post hoc test was used for the pairwise comparisons.

The alpha level of .05 was used in the analyses. For the pairwise comparisons, Bonferroni correction was applied. Alpha values were taken as .025 and .012, respectively for age and branch.

## 3.9 Assumptions

These assumptions provide the basis for this study:

- The survey (HEXAD) Gamification User Scale was carefully and precisely filled out.
- Teachers were given definitions of game elements in case they did not know them. Thus, avoiding misunderstanding or lack of information.
- During the collection of quantitative data, the participants were truthful.

- The study's validity and reliability were attempted to be assured using the relevant techniques.

## 3.10 Limitations

The current study has several shortcomings that must be taken into account. The following can be used to summarize them:

- The findings of this study were based on the in-service teachers in Turkey.
- Since the participants filled out the HEXAD scale using an online platform, the researcher was not present when the participants were completing it.
- The research was restricted to seventeen game components that were derived from various models, including DMC and MDA. Different outcomes could be obtained by combining various game features.
- Another limitation of this study is that teachers determine game element preferences without experiencing them. To clarify, the teachers who do not play games may not be aware of their game preferences and may not be proficient with game design terminology. To prevent misunderstandings, descriptions of game elements have also been added to the online form.
- Teachers were selected biasedly. This is due to the fact that they applied to the Digital Teachers Project in order to develop their digital skills. It is possible that the teachers that took part in this study were already tremendously motivated.
- The findings from causal-comparative studies should be approached with care, as they do not establish a causal relationship (Fraenkel & Wallen, 2008).

# CHAPTER 4

# RESULTS

This chapter includes results of the study aiming to answer specified research questions in Chapter 1. Therefore, the results are presented under each research question.

## 4.1 RQ1: What are teachers' gamification user types?

**Table 10**

*Teachers' Gamification User Types*

| Gamification User Types | Mean | Standard Deviation |
|---|---|---|
| Philanthropist | 25.76 | 2.51 |
| Free spirit | 25.61 | 2.49 |
| Achiever | 25.36 | 2.77 |
| Socialiser | 24.45 | 3.14 |
| Player | 21.63 | 4.36 |
| Disruptor | 11.20 | 5.36 |

The dominant gamification user type of teachers is *philanthropist* (*M*= 25.76, *SD*= 2.51). The user type order of teachers continues as follows, decreasing; *free spirit* (*M*= 25.61, *SD*= 2.49), *achiever* (*M*= 25.36, *SD*= 2.77), *socialiser* (*M*= 24.45, *SD*= 3.14), and *player* (*M*= 21.63, *SD*= 4.36). The least dominant user type is *disruptor* (*M*= 11.20, *SD*= 5.36).

The dominant user types of teachers change based on different branches. The dominant user type of both classroom (*M*=25.93, *SD*=2.40) and science teachers

(*M*=25.24, *SD*=2.53) is philanthropist. The dominant user type of English teachers was found to be both philanthropist (*M*=25.74, *SD*=2.56) and free-spirit (*M*=25.74, *SD*=2.52) with equal mean. On the other hand, mathematics teachers are the only free-spirit user type dominant branch (*M*=25.61, *SD*=2.39). When teachers from subject areas other than classroom, English, and science were pooled, their dominant user types were also found to be philanthropist (*M*=25.62, *SD*=2.72). As a branch-based dominant user type, socialiser, achiever, and disruptor did not exist.

## 4.2 RQ1.1: Do gamification user types differ by teachers' demographics?

- **Age**

A one-way MANOVA was performed to determine whether teachers' gamification user types differ by age (Table 11). MANOVA results revealed that there were significant differences among the age categories based on user types ($F$ (12, 3120) = 6.726, $p < .05$; Pillai's trace=.050).

**Table 11**

*Multivariate test for age*

| | Value | F | Hypothesis df | Error df | P |
|---|---|---|---|---|---|
| Pillai's trace | .050 | 6.726 | 12 | 3120 | .000 |

In order to reveal which age categories differ by gamification user types, a one-way ANOVA was conducted with Bonferroni correction for player and disruptor user types.

**Table 12**

*Between-subjects effects for age categories*

| | 24-33 (n=214) | | 34-43 (n=813) | | 44-66 (n= 540) | | p | Partial η2 |
|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD | | |
| Philanthropist | 25.64 | 2.62 | 25.70 | 2.53 | 25.81 | 2.55 | .640 | - |
| Free spirit | 25.72 | 2.59 | 25.63 | 2.52 | 25.40 | 2.59 | .156 | - |
| Player | 22.80 | 4.19 | 21.97 | 4.20 | 20.57 | 4.51 | .000 | .033 |
| Socializer | 24.11 | 3.45 | 24.49 | 3.09 | 24.34 | 3.24 | .274 | - |
| Achiever | 25.46 | 2.79 | 25.33 | 2.78 | 25.21 | 2.87 | .492 | - |
| Disruptor | 12.12 | 5.40 | 11.19 | 5.39 | 10.83 | 5.15 | .011 | .006 |

A one-way ANOVA revealed that there was a significant difference in player user type between at least two groups ($F$ (2, 1564) = 26.906, $p$< .025) and in disruptor user type ($F$ (2, 1564) = 4.561, $p$ < .025). Scheffe post hoc test for player user type showed that age group 24-33's player user type score ($M$= 22.80, $SD$= 4.19) was significantly higher than age group 44-66's scores ($M$= 20.57, $SD$= 4.51). Also, age group 34-43's player user type score ($M$= 21.97, $SD$=4.20) was significantly higher than age group 44-66's scores ($M$= 20.57, $SD$= 4.51). Regarding disruptor user type, Scheffe post hoc test for disruptor user type showed that age group 24-33's disruptor user type score ($M$=12.12, $SD$=5.40) was significantly higher than age group 44-66's scores ($M$= 10.83, $SD$=5.15).

- **Gender**

A one-way MANOVA was conducted to determine whether there is a difference between males and females on gamification user types (Table 13). There were significant differences in user types based on gender ($F$ (6,1867) = 10.26, $p$< .05; Pillai's trace=.032).

**Table 13**

*Multivariate test for gender*

| | Value | F | Hypothesis df | Error df | P |
|---|---|---|---|---|---|
| Pillai's trace | .032 | 10.26 | 6 | 1867 | .000 |

When between-subjects are examined, it was seen that female teachers have significantly higher philanthropist (*M*=25.86, *SD*=2.41), free spirit (*M*=25.75, *SD*= 2.38), socializer (*M*=24.53, *SD*=3.12), achiever (*M*=25.41, *SD*=2.70) scores than male teachers. However, male teachers have significantly higher disruptor (*M*=12.43, *SD*= 5.82) scores than female teachers. All effect sizes are small effect size because .5 is threshold for a large effect (Field et al., 2012).

**Table 14**

*Between-subjects effects for gender*

| | Female (n=1576) | | Male (n= 298) | | p | Partial η2 |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | | |
| Philanthropist | 25.86 | 2.41 | 25.22 | 2.94 | .000 | .009 |
| Free spirit | 25.75 | 2.38 | 24.88 | 2.93 | .000 | .016 |
| Player | 21.66 | 4.35 | 21.46 | 4.42 | .482 | - |
| Socializer | 24.53 | 3.12 | 24.01 | 3.24 | .008 | .004 |
| Achiever | 25.41 | 2.70 | 25.06 | 3.13 | .047 | .002 |
| Disruptor | 10.97 | 5.24 | 12.43 | 5.82 | .000 | .010 |

- **Grade Level**

A one-way MANOVA was conducted to determine whether there is a difference between primary and middle school teachers on gamification user types (Table 15). There were significant differences in user types based on grade level of teachers ($F$ (6,1808) = 7.161, $p$< .05; Pillai's trace=.023).

**Table 15**

*Multivariate test for grade level*

| | Value | F | Hypothesis df | Error df | P |
|---|---|---|---|---|---|
| Pillai's Trace | .023 | 7.161 | 6 | 1808 | .000 |

When between-subjects are examined, it was seen that teachers in primary school level have significantly higher philanthropist ($M$= 25.94, $SD$=2.37), free spirit ($M$=25.71, $SD$=2.40), socializer ($M$=24.75, $SD$=2.98), achiever ($M$=25.53, $SD$= 2.66) scores than teachers in middle school level. All effect sizes are small effect size because .5 is threshold for a large effect (Field et al., 2012).

**Table 16**

*Between-subjects effects for grade level*

| | Primary (n=1122) | | Middle (n=693) | | p | Partial η2 |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | | |
| Philanthropist | 25.94 | 2.37 | 25.43 | 2.72 | .000 | .010 |
| Free spirit | 25.71 | 2.40 | 25.43 | 2.63 | .018 | .003 |
| Player | 21.50 | 4.41 | 21.83 | 4.26 | .118 | - |
| Socializer | 24.75 | 2.98 | 24.01 | 3.31 | .000 | .013 |
| Achiever | 25.53 | 2.66 | 25.05 | 2.90 | .000 | .007 |
| Disruptor | 11.03 | 5.39 | 11.46 | 5.28 | .096 | - |

- **Branch**

A one-way MANOVA was done to examine whether teachers' gamification user types differ by branch. MANOVA results revealed that there were significant differences among the branch categories based on the user types ($F$ (18, 4317) = 3.441, $p < .05$; Pillai's trace=.042).

**Table 17**

*Multivariate test for branches*

| | Value | F | Hypothesis df | Error df | p |
|---|---|---|---|---|---|
| Pillai's trace | .042 | 3.441 | 18 | 4317 | .000 |

In order to reveal which branch categories differ by user types, a one-way ANOVA was conducted with Bonferroni correction for philanthropist, freespirit, player, and socializer user types.

**Table 18**

*Between-subjects effects for branches*

| | Classroom (n=1005) | | English (n=168) | | Science (n=151) | | Mathematics (n=122) | | p | Partialη 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD | M | SD | | |
| Philanthropist | 25.93 | 2.404 | 25.74 | 2.565 | 25.24 | 2.537 | 25.48 | 2.399 | .005 | .009 |
| Free spirit | 25.71 | 2.435 | 25.74 | 2.524 | 25.00 | 2.493 | 25.61 | 2.390 | .009 | .008 |
| Player | 21.43 | 4.385 | 22.55 | 3.787 | 21.43 | 3.976 | 22.48 | 3.870 | .002 | .010 |
| Socializer | 24.80 | 2.953 | 24.20 | 3.564 | 23.97 | 2.995 | 24.04 | 2.862 | .000 | .012 |
| Achiever | 25.56 | 2.683 | 25.26 | 2.910 | 25.02 | 2.848 | 25.35 | 2.619 | .094 | - |
| Disruptor | 10.95 | 5.376 | 10.92 | 5.596 | 11.75 | 5.244 | 11.88 | 5.511 | .128 | - |

A one-way ANOVA indicated that there was a significant difference in philanthropist user type between at least two groups ($F$ (3, 1442) = 4,324 , $p$< .012), in free spirit user type ($F$ (3, 1442) = 3,839, $p$ < .012), in player user type ($F$ (3, 1442) = 5,096 , $p$< .012), and in socializer user type ($F$ (3, 289,775) = 5,973 , $p$ < .012). Regarding whether philanthropist user type scores differ by branch, Scheffe post hoc test results showed no significant difference ($p$ > .012). Regarding free spirit user type, Scheffe post hoc test results showed that classroom teachers have significantly higher free spirit user type scores ($M$= 25.71, $SD$= 2. 44) than science teachers ($M$= 25.00, $SD$= 2.49). Regarding whether player user type scores differ by branch, Scheffe post hoc test results showed no significant difference ($p$ > .012). Regarding socializer user type, Games-Howell post hoc test results showed that classroom teachers have significantly higher socializer user type scores ($M$= 24,80, $SD$= 2. 95) than science teachers ($M$= 23.97, $SD$= 2.99).

## 4.3 RQ2: Which game elements do teachers prefer for gamification design?

The most preferred five game elements are *reinforcement and feedback* (n=1024, 54.6%), *onboarding* (n=898, 47.6%), *relationships* (n=771, 41.1%), *narrative* (n=754, 40.2%) and *teams* (n=754, 40.2). Furthermore, the least preferred five elements are *ranking/leaderboard* (n=140, 7.5%), *virtual goods* (n=177, 9.4%), *points* (n=359, 19.2%), *levels* (n= 363, 19.4%), and *customization* (n=402, 21.5%).

**Table 19**

*Teachers' game element preferences*

| Game Elements | n | Prefers | % |
|---|---|---|---|
| Reinforcement and feedback | 1874 | 1024 | 54.6 |
| Onboarding | 1874 | 898 | 47.9 |
| Relationships | 1874 | 771 | 41.1 |
| Narrative | 1874 | 754 | 40.2 |
| Teams | 1874 | 754 | 40.2 |
| Tasks | 1874 | 748 | 39.9 |
| Rules | 1874 | 570 | 30.4 |
| Achievements | 1874 | 535 | 28.5 |
| Challenges | 1874 | 522 | 27.9 |
| Badges | 1874 | 464 | 24.8 |
| Content Unlocking | 1874 | 450 | 24 |
| System Onboarding | 1874 | 421 | 22.5 |
| Customization | 1874 | 402 | 21.5 |
| Levels | 1874 | 363 | 19.4 |
| Points | 1874 | 359 | 19.2 |
| Virtual Goods | 1874 | 177 | 9.4 |
| Ranking/Leaderboard | 1874 | 140 | 7.5 |

## 4.4 RQ3: What is the relationship between teachers' gamification user types and their preferred game elements for gamification design?

A point biserial correlation was computed to assess the relationship between teachers' gamification user types and their preferred game elements for gamification design (Table 20). Normal distribution was accepted as assumption.

Relationship between Philanthropist user type and Game Elements

There was a significant but very weak positive relationship between philanthropist user type and relationships, $r(1872) = (.086)$, $p < .01$. There was a significant but very weak negative relationship between philanthropist user type and levels, $r(1872) = (-.063)$, $p < .01$. There was a significant but very weak negative relationship between philanthropist user type and points, $r(1872) = (-.048)$, $p < .05$. The results indicated that the relationship between philanthropist user type and other elements not explicitly mentioned in this paragraph was not significant.

Relationship between Free-spirit user type and Game Elements

There was a significant but very weak positive relationship between free-spirit user type and relationships, $r(1872) = (.075)$, $p < .01$.There was a significant but very weak positive relationship between free-spirit user type and content unlocking, $r(1872) = (.088)$, $p < .01$. There was a significant but very weak positive relationship between free-spirit user type and customization, $r(1872) = (.075)$, $p < .01$. The results indicated that the relationship between free-spirit user type and other elements not explicitly mentioned in this paragraph was not significant.

**Table 20**

*Correlation between Gamification User Types and Preferred Game Elements*

| Game Elements | Gamification User Types | | | | | |
|---|---|---|---|---|---|---|
| | Philanthropist | Free-spirit | Player | Socialiser | Achiever | Disruptor |
| Reinforcement and feedback | .009 | -.021 | .004 | -.036 | -.012 | .015 |
| Onboarding | .023 | -.013 | -.102** | -.030 | -.042 | .003 |
| Relationships | .086** | .075** | -.106** | .104** | .054* | -.114** |
| Narrative | -.042 | -.033 | -.083** | -.032 | -.040 | .002 |
| Teams | .042 | .029 | -.012 | .085** | .044 | -.011 |
| Tasks | -.023 | -.041 | -.012 | -.007 | -.028 | .013 |
| Rules | -.023 | -.039 | .013 | -.016 | -.009 | -.053* |
| Achievements | -.039 | -.018 | .148** | .003 | .010 | -.003 |
| Challenges | .009 | .004 | .059* | -.021 | .057* | .080** |
| Badges | .031 | .042 | .128** | .046* | .031 | .034 |
| Content Unlocking System | .028 | .088** | .042 | -.015 | .051* | -.035 |
| Onboarding | -.017 | -.042 | -.102** | -.013 | -.040 | -.002 |
| Customization | .034 | .062** | -.075** | -.015 | .013 | -.019 |
| Levels | -.063** | -.044 | -.016 | -.041 | -.057* | .053* |
| Points | -.048* | -.036 | .099** | -.030 | -.041 | -.013 |
| Virtual Goods | -.016 | .012 | .036 | .016 | .017 | .051* |
| Ranking/ Leader board | -.036 | -.032 | .018 | -.023 | -.027 | .047* |

Relationship between Player user type and Game Elements

There was a significant but very weak negative relationship between player user type and onboarding, $r(1872) = (-.102)$, $p < .01$. There was a significant but very weak negative relationship between player user type and relationships, $r(1872) = (-,106)$, $p < .01$. There was a significant but very weak negative relationship between player user type and narrative, $r(1872) = (-,083)$, $p < .01$. There was a significant but weak positive relationship between player user type and achievements, $r(1872) = (,148)$, $p < .01$. There was a significant but very weak positive relationship between player user type and challenges, $r(1872) = (,059)$, $p < .05$. There was a significant but weak positive relationship between player user type and badges, $r(1872) = (,128)$, $p < .01$. There was a significant but very weak negative relationship between player user type and system onboarding, $r(1872) = (-,102)$, $p < .01$. There was a significant but very weak negative relationship between player user type and customization, $r(1872) = (-,075)$, $p < .01$. There was a significant but very weak positive relationship between player user type and points, $r(1872) = (,128)$, $p < .01$. The results indicated that the relationship between player user type and other elements not explicitly mentioned in this paragraph was not significant.

Relationship between Socialiser user type and Game Elements

There was a significant but weak positive relationship between socialiser user type and relationships, $r(1872) = (,104)$, $p < .01$. There was a significant but weak positive relationship between socialiser user type and teams, $r(1872) = (,085)$, $p < .01$. There was a significant but weak positive relationship between socialiser user type and badges, $r(1872) = (,046)$, $p < .05$. The results indicated that the relationship between socialiser user type and other elements not explicitly mentioned in this paragraph was not significant.

Relationship between Achiever user type and Game Elements

There was a significant but weak positive relationship between achiever user type and relationships, $r(1872) = (,054)$, $p<.05$. There was a significant but weak positive relationship between achiever user type and challenges, $r(1872) = (,057)$, $p< .05$. There was a significant but weak positive relationship between achiever user type and content unlocking, $r(1872) = (,051)$, $p< .05$. There was a significant but weak negative relationship between achiever user type and levels, $r(1872) = (-,057)$, $p< .05$. The results indicated that the relationship between achiever user type and other elements not explicitly mentioned in this paragraph was not significant.

Relationship between Disruptor user type and Game Elements

There was a significant but weak negative relationship between disruptor user type and relationships, $r(1872) = (-.114)$, $p< .01$. There was a significant but weak negative relationship between disruptor user type and rules, $r(1872)= (-.053)$, $p<.05$. There was a significant but weak positive relationship between disruptor user type and challenges, $r(1872) = (.080)$, $p<.01$. There was a significant but weak positive relationship between disruptor user type and levels, $r(1872) = (.053)$, $p<.05$. There was a significant but weak positive relationship between disruptor user type and virtual goods, $r(1872) = (,051)$, $p<.05$. There was a significant but weak positive relationship between disruptor user type and ranking/leader board, $r(1872) = (,047)$, $p<.05$. The results indicated that the relationship between disruptor user type and other elements not explicitly mentioned in this paragraph was not significant.

# CHAPTER 5

# DISCUSSION AND CONCLUSION

In this final chapter, the findings of the research are discussed in detail. The contribution of these findings to theory and practice is interpreted. Moreover, implications and recommendations for practitioner are addressed. A section for suggestions for future work is also included.

## 5.1 In Service Teachers' Gamification User Types

This study was designed to explore the gamification user types of in-service teachers in Turkey. To this end, data was collected from 1874 in-service teachers, a total of 1961 participants at the beginning but the overall sample was made up of 1874 people after outliers were subtracted from the number of valid responses, in various cities across Turkey, both metropolitan and small cities. The collection of data from different regions of Turkey affects the high diversity and this contributed to the more generalizability of the collected data.

This study presented that gamification user types of teachers are as the following:

1. Philanthropist,
2. Free spirit,
3. Achiever,
4. Socialiser,
5. Player,
6. Disruptor.

The results disclosed that philanthropist is the most common gamification user type among teachers. Philanthropists are driven by a sense of purpose and meaning and grouped under intrinsic user types (Marczewski, 2013). This group is generous, seeking to help others and improve their lives without expecting anything in return. Walker (2020) highlights that teachers should have the ability to help their pupils in the learning process. As individuals working in the field of education, teachers' willingness to help their students and contribute to their development may explain their inclination towards the philanthropist type. This result may reflect that these teachers generally have a self-sacrificing and contribution-oriented attitude. Therefore, it is not surprising to find teachers in Turkey committed to helping others.

The results of this study also support the results of previous studies. Firstly, Tondello et al. (2016) aimed to determine gamification user types of 1033 graduate and undergraduate students in their research of implementing the Hexad scale. Their results revealed that 24% of the participants' user type were *philanthropist*, 24% were *achiever*, 22% were *free spirit*, %19 were *socialiser*, %10 were *player*, and %10 were *disruptor*. Therefore, it is clear that the results of the study of Tondello et al. (2016) were largely replicated because the order of dominant user types revealed in this study is almost the same as Tondello and colleagues' research. The only difference is that free-spirit and achievers replace each other. Secondly, Şenocak et al. (2021) investigated the distribution of Hexad gamification user types as well as the relationships of gamification experience, game mode, and gender with the user types' scores in the context of an open and distance learning system. Their results showed that the most prevalent user types followed this order: *philanthropist*, *achiever*, *free spirit*, *socialiser*, *player*, and *disruptor*. While the results of studies of Tondello et al. (2016) and Şenocak el al. (2021) are quite similar, this study' findings are also so close to them in terms of distribution of gamification user types.

Another issue is that in this study, also in the studies mentioned above, the lowest user type ratio of teachers belongs to disruptor. There may be potential reasons why the distribution of disruptor is low compared to other user types. Firstly, it may be

related to the role and expectations of the teaching profession. The typical image of a teacher is one who upholds discipline and follows established educational frameworks and curricula. The decreased predominance of the disruptor type may be due to disruptive behaviour not aligning with teachers' expectations and duties. Moreover, teachers frequently have to make sure that their kids are learning in a secure environment. Therefore, teachers may be reluctant to engage in disruptive behaviours due to worries about maintaining control of the classroom. Secondly, it may be related to teachers' training and professional norms. Teachers often receive formal training and follow accepted pedagogical standards and practices. These expectations could prevent rude or disrespectful attitude in the classroom. Finally, the low number of disruptors could be good news for the Turkish education system. If there were a higher number of disruptors in the teacher distribution, this might lead to innovation in education or potential challenges in maintaining classroom order.

Furthermore, free spirit and achiever gamification user types, which are second and third in prevalence among teachers, should also be highlighted. The significant percentage of teachers who identify as free spirit users shows that many Turkish educators have attributes like curiosity, exploration, and a need for novelty. This propensity can be helpful in the classroom since it motivates educators to look for cutting-edge instructional strategies, try out new technologies, and adjust to students' shifting needs. Moreover, the prevalence of the achiever user type among teachers shows that many of the educators in the study are extremely goal-oriented and driven by accomplishments. This quality may encourage teachers to hold themselves and their pupils to high standards, which would boost academic results.

To conclude, gamification designs to be prepared in the future should strive to incorporate a broader array of game elements, with particular attention to catering to the preferences and intrinsic motivations of the first three predominant user groups, including philanthropists, achievers, and free spirits. This approach can lead to more successful gamified educational interventions by aligning game elements with the intrinsic motivations of the majority of users.

### 5.1.1 Differences in gamification user types according to in-service teachers' demographics

One of the focuses of this study was to investigate whether gamification user types differ based on teachers' demographics, particularly age, gender, grade level, branch. Consequently, a number of statistical tests (one-way MANOVA and one-way ANOVA) were performed to investigate the association between user types for gamification and demographics. The results of the analyses have been discussed below in the context of each demographic:

Firstly, when the link between age groups and gamification user types was first investigated, the findings showed that there were significant differences among the age groups depending on gamification user types, which implies that gamification user types differ by teachers' demographics.

When different age groups were examined for *player* user type, it was seen that; age group 24-33 had considerably higher player user type scores than age group 44-66. Similarly, the player user type score for the age group 34-43 was substantially higher than what was found for the age group 44-66. Specifically, younger teachers tend to exhibit higher player user type scores compared to their older counterparts. The past research by Kotsopoulos et al. (2018) proving that the younger participants tend to be more motivated by the achiever and player motivations also is in line with this study. This result may indicate that young teachers are more influenced by the game elements of player user type, particularly external rewards such as points, badges, and leaderboards. While older or less tech-savvy learners might have been less responsive, younger students might be more open to the playfulness that game elements encourage (Hallifax et al., 2020). Moreover, maintaining social relationships or engaging in social interaction is the main reason older individuals play video games (Altmeyer & Lessel, 2017). Therefore, external rewards may not affect older teachers as much as younger ones and that is why they may not be as dominant as young people in the achiever player type.

When different age groups were examined for *disruptor* user type, it was uncovered that disruptor user type scores for age groups 24-33 were substantially higher than those for age groups 44-66. It shows that, as mentioned above, the younger group dominates the disruptor user type more than the older group. It may imply that young disruptor teachers more consistently put themselves or others under pressure, forcing the system to change in either a good or bad way than older teachers as Marczewski (2015) stated. This may be due to young people being able to adapt to change more easily than older people. As individuals age, they learn new information and respond to simple stimuli more slowly, which could reduce their capacity to adapt (Stern et al., 2000). In addition, young people may not be satisfied with the current conditions and have negative attitudes compared to older people. In comparison to younger generations, older generations were thought to be more optimistic (Weiss & Zhang, 2020). In addition, young people can find it entertaining to oppose the established system and challenge traditional norms because of their nature. Young ages are naturally characterized by rebellion. People are currently examining their identities and aiming for independence from those in positions of power. Therefore, young teachers may demonstrate their autonomy and identity by opposing the current system.

Secondly, when the relationship between gender and gamification user types was examined, it came to light that female teachers scored significantly higher on the philanthropist, free spirit, socialiser, and achiever user type compared to male teachers. Male teachers, on the other hand, had considerably higher disruptor scores than female teachers. This result coincided with the results of Şenocak et al. (2021), as they discovered that females typically scored higher on the disruptor user type than males. Furthermore, it is slightly similar with results of Mora et al. (2019) concluding that disruptors and players were more mostly men, and quite similar with Tondello et al. (2019) concluding that while males seem to score slightly higher in disruption, women appear to score slightly higher in philanthropy, socializing, autonomy, and achievement.

Moreover, current study is also in line with another study's results Martucci et al. (2023) asserting that female players seemed to use games for social and interpersonal purposes, whilst male players seemed more focused on playing to compete with others. According to the alignment with the findings of Enocak (2021), Mora et al. (2019), and Tondello et al. (2019), gender-related differences in gamification user types may be constant across various situations and populations. One of the reasons for this difference may be social and cultural standards that may in part explain the finding. Traditional gender norms and preconceptions regarding male conduct being more forceful, competitive, or even disruptive exist in many societies. These expectations may have an impact on how both men and women perceive and communicate their preferences and behaviors, including their tendencies for gamification. The findings indicate that gender plays a role in shaping gamification user types among teachers and were parallel with the previous study (Tondello et al., 2019) suggesting that people's Hexad user type is correlated with their gender. Returning to the results of this study, female teachers tend to score higher on user types associated with self-expression, competence, cooperative and collaborative gameplay, social interaction, such as philanthropist, free spirit, socializer, and achiever. Additionally, as Marczewski (2015) suggests, change motivates disruptors, thus motivating male teachers in this study. However, it is worth noting that all the impact sizes reported in these discrepancies are classified as small effect sizes. This suggests that while statistically significant, the practical significance of these differences may be relatively minor. Another reason for this difference may be related to females' motivational factors. According to Santos et al (2021), women were driven by the types of users who are intrinsically motivated (achiever, philanthropist, socialiser, and free spirit), so which may be an answer for gender based differences in user types.

Thirdly, the analysis revealed that there are indeed significant differences in gamification user types based on the grade level taught. The first of these, primary school teachers had significantly higher scores on the philanthropist, free spirit,

socializer, and achiever user types compared to middle school teachers. These results may reflect that primary school teachers exhibit a stronger inclination towards gamification user types motivated by purpose and meaning, autonomy and self-expression, relatedness and mastery as Marczewski (2015) stated. However, it is crucial to remember that even though these differences are statistically significant, their practical importance may only be tiny, since all of the effect sizes that have been detected in these changes have been classified as small effect sizes.

Fourthly and lastly, the results showed that there are significant differences in gamification user types based on the branch taught. While there were no significant differences in philanthropist and player user types among branch categories, the differences observed in free spirit and socializer user types are noteworthy. Classroom teachers exhibited higher scores in both free spirit and socializer user types compared to science teachers. These findings might be a sign of how the branch and teaching context affect teachers' preferences for particular gamification user types. The free spirit and socializer user types, which place an emphasis on self-expression, social contact, and discovery, may find stronger harmony with classroom teachers who frequently engage with younger pupils and in more diverse teaching contexts. Science teachers, on the other hand, may gravitate toward a different set of user types due to the nature of their branch, which may include rigid and discipline-specific teaching methods.

## 5.2 In service teachers' game element preferences for gamification design

The participants were questioned which of the gamification components they would use if they decided to gamify their lessons in the future. More specifically, teachers were asked to select the five elements that most appealed to them as users or designers among 17 game elements (narrative, rules, challenges, system onboarding, reinforcement and feedback, achievements, points, levels, ranking/leaderboard,

badge, customization, virtual goods, tasks, teams, content unlocking, and relationships).

As a result, this study revealed that the top five game element preferences of in-service teachers are as follows:

- reinforcement and feedback,
- onboarding,
- relationships,
- narrative, and
- teams.

According to in-service teachers' preferences, it can be concluded that more than half of the teachers give importance to feedback and reinforcement. Teachers may pick these components for a variety of reasons. Immediate feedback in gamification offers valuable educational benefits, such as obtaining real-time feedback on the performance, allowing individuals to pinpoint areas for development and modify their learning methods (Putu Wulantari et al., 2023). Therefore, teacher may prefer feedback because they wanted to follow the performance on a real-time basis. The onboarding is in second place, so teachers may consider the onboarding as an element that enriches the educational experience. Relationships rank third, which may indicate that student-teacher and teacher-teacher relationships play a critical role in the teaching process. Narrative ranks fourth, and it may be supported that in a gamified learning environment narrative should be present (Aldemir et al., 2018). "Good games have good backstories" (Reeves & Read, 2009, p. 68). The argument may also be supported by the significant demand for narrative within the gamification context. Previous studies showed that the narrative enhances player performance (Leuchter & Kurtz, 2022), increase engagement (Jemmali et al., 2022), affect cognition and boost motivation (Plass et al., 2020). Therefore, teachers may have wanted to use narrative in gamified lessons to take advantage of these effects.

Teams are in fifth place, which emphasizes the importance of cooperation and teamwork in a gamified environment.

Additionally, the five least preferred elements were listed according to their responses. Their five least preferred game elements are as follows:

- ranking/leaderboard,
- virtual goods,
- points,
- levels, and
- customization.

As seen above, the least preferred element by teachers is the ranking/leaderboard, which may indicate that the competitive element is less important for teachers. This finding supports the argument made by Çakıroğlu et al. (2017), who found that competition emerged as a negative component of practical tasks. It may demotivate poorly ranked users to see themselves on the leaderboard (Werbach & Hunter, 2012). Also, the second least selected element, virtual goods, which may reflect those virtual rewards are not as attractive as physical rewards. Virtual goods are valuable or distinctive in a gaming environment and can be bought with actual cash or earned through in-game achievements (Werbach & Hunter, 2012). However, buying virtual goods can provide competitors an unfair advantage because they can strengthen the game character (Hamari & Lehdonvirta, 2010). In this study, virtual goods refer to items that can be purchased with the points collected in the game. At this point, For people who do not have enough points to buy the items they want, the virtual good item may not be motivating, it may even be demotivating. This may be why the preference for using virtual goods is so low among in-service teachers. Moreover, since attitudes regarding virtual items aren't developed in isolation, but rather within the social networks present in these games, the quantity of friends and social interactions could serve as a noteworthy influencing factor (Hamari, 2015). Teachers might avoid using it because their fellow educators share the same reluctance. This

reluctance could stem from the belief that virtual goods might not effectively motivate primary and secondary school students they teach. Points took the third place, which may indicate that the scores are less effective in providing student motivation for teachers. Although points appear to be a fundamental part of gamified interventions (Lewis et al., 2016), the teachers in this study seem to have hesitated to choose it. There could be a number of causes for this preference. The points might have seemed unrelated to the teachers' teaching objectives or out of line with their views on instruction. Another possibility is the teachers may have been reluctant to use gamified treatments or points systems again if they had a bad experience with them in the past. Then levels ranked fourth, which may indicate that levelling up makes a limited contribution to the teaching experience. People who favour using points in gamified applications are more likely to also favour using badges and levels (Jia et al., 2016). Therefore, it is not surprising that the preference for both level and point use is low. Customization ranked fifth from the end, which may reflect that the teachers attach less importance to customization which might be general or person-specific. While general customisation comprises using the players' names and greeting them, specific customization makes use of the player's performance evaluation to deliver a learning module that is appropriate for their degree of subject expertise (Nah et al., 2013).

As mentioned above, this study revealed the game elements that teachers preferred the most and the least. It is not surprising that the findings of this study contradict some studies in the literature while supporting others. A study concluded that while levels, questions and challenges, and progress bars are most used in e-learning websites; leader boards, badges, and other tools, including virtual currencies, virtual goods, and countdown clocks were least used ones based on the analysis of fifteen e-learning websites (Rebelo & Isaías, 2020). Although level was one the most used elements in this study, it was among the least preferred components for use by the participants in this study. On the other hand, it is a common point that leaderboards and virtual goods are among the least preferred elements, as seen in the results of

this study, and study of Rebelo and Isaas (2020). At this point, it may be necessary to ask the question whether PBLs have lost their importance or influence. Or did individuals become aware of these elements or hear criticism of them?

Points, badges, leaderboards, and feedback are extensively researched game design elements (Mekler et al., 2013). Similarly, Dicheva et al. (2015) declared that the most widely used game elements that were identified in their systematic mapping research of gamification in education were points, badges, and leaderboards. Furthermore, in many research studies, while elements other than PBLs are not given much opportunity, binary variations such as point-badge, point-leaderboard, badge-leaderboard are also used (Balci et al., 2022; Durmaz et al., 2022). Unfortunately, this may be due to the fact that many gamification designers think that gamification can be achieved simply by adding the point, badge, and leaderboard components to a system (Chou, 2019). Moreover, the high price of less-commonly utilized game design features and the lack of certainty regarding success are actual obstacles to integrating other game design elements (Mazarakis, 2021).

More importantly, two of the less preferred five elements by in-service teachers participated in this study were point and leaderboard. This could be that teachers are tired of seeing PBLs in every gamified environment. Another reason may be because teachers have heard or read somewhere about the effective use of point and leaderboard. For instance, leaderboards are significantly linked to a number of harmful impacts (Bräuer & Mazarakis, 2019; Toda et al., 2017). In other words, it can be concluded that for some reasons, a response was received from a conscious sample group regarding the choice of usage of game elements. This could also be a concrete example of a warning against the widespread use of points and leaderboards in gamified learning environments.

Against all this PBLs themed gamification world, this study gave a chance to the presence of less commonly used elements in gamification designs and research by offering a choice of 17 game elements. The most important reason for this the

elements other than PBLs (points, badges, leaderboards) appear to offer a variety of advantages. Gamification components like reward, completion, and collaboration foster favourable attitudes in students towards the curriculum and increase their willingness to learn (Almalki, 2022). To boost motivation, using the progress bar and badges is advised (Mazarakis & Bräuer, 2023).

## 5.3 Relationship between teachers' gamification user types and their preferred game elements for gamification design

The correlation between teachers' gamification user types and the game elements they prefer for gamification design was investigated. The results showed that mostly there was no correlation between variables. In those where there was a correlation, it was very weak.

An important output based on the correlation results is that player is associated with more game elements (nine in total) among user types compared to other types. Among the game elements, achievements, challenges, badges and points have a weak but positive correlation with the player user type. It is unsurprising to discover a positive correlation between these elements and player user types, as Tondello et al. (2019) suggested that points, leader boards, badges, and achievements are recommended game elements for player user types.

Another important result is that a game element has correlations with more than one user type. In other words, it has preferred features for several user types. Tondello et al. (2019) attribute this to the interrelated nature of some of the underlying motivations of these user types. For example, relationships have correlations with all user types. While it exhibits negative relationships with player and disruptor user types, it demonstrates a positive relationship with the other elements.

## 5.4 Implications for Practice

Considering the fact that teachers have a significant impact on students' motivation and success as well as improving learning and learner engagement (Krishnamurthy et al., 2022), it should be well implemented into classrooms. In other words, if countries want to raise more successful generations, teachers should be able to adapt gamification based on demands of the era. In these circumstances, gamification is an obvious request considering the positive perceptions of both students (Rajšp et al., 2017; Bicen & Kocakoyun, 2018), pre-service and in-service teachers (Alabbasi, 2018) towards use of gamified activities. However, there are various barriers in gamification adoption of the teachers. According to Dicheva et al. (2015), one of the main barriers to integrating gaming aspects into education is the absence of adequate technology assistance. Moreover, Laskowski and Borys (2016) found out that the lack of time to design a gamified course, according to the professors, is another justification for not adopting gamification. To be mentioned more comprehensively, the primary obstacles teachers encounter when implementing gamification in their courses include: i) resource constraints (insufficient time, training, classroom infrastructure, and financial support), ii) student disinterest (lack of engagement), iii) subject matter, and iv) classroom dynamics." (Sánchez-Mena & Martí-Parreño, 2017). The results indicate that a lack of resources is a major barrier limiting teachers from implementing gamification in their courses. Teachers' concerns regarding resource shortages encompass: i) insufficient time for gamified class preparation, ii) inadequate materials for gamified courses, and iii) a lack of specialized training for gamification instruction. This study may be useful in solving the second problem (ii), inadequate material, by pioneering the development of materials in line with the game elements that teachers prefer to use in their lessons. Gamification designers and curriculum developers can take these preferences into account and develop materials that focus on the five dominant elements.

Moreover, the last item (iii), namely, the lack of specialized training for gamification instruction, can be an indication that gamification should be integrated in professional development trainings. Teachers should be given professional development about gamification. The outputs of this study can inform professional development programs for teachers. In this sense, other studies on the inclusion of gamification in teachers' professional development may also show that there is a demand for this in society. The findings from action research demonstrated robust support for the adoption of gamification in an educational context, and benefit for teachers' professional development (Greaves & Vlachopoulos, 2023). This approach effectively serves as a valuable avenue for professional development in schools, encourages the exchange of pedagogical ideas, and increases the confidence of individual teachers in utilizing various teaching strategies. Furthermore, teachers may be given practical recommendations on how to create material quickly as they lack the time to create gamified courses.

Moreover, if teachers were able to find appropriate tools for gamified learning activities, they would be willing to incorporate gamification in their lessons (Jassem & Piskadło, 2015). This is why there should be trainings that will enable teachers to develop suitable tools for gamified learning environments within the framework of teacher professional developments.

The fact that this study makes it possible to directly ask users which element they prefer is a very useful contribution. Each game element serves different motivations. Teachers need to use them consciously and purposefully because randomly chosen game aspects typically cause players to become less motivated (Reyssier et al., 2022). In this sense, determining which elements teachers are prone to use can help predict which type of users they address in possible gamified lessons. However, this is still an open-ended solution because the findings of earlier study showed that preferences for game elements did not match those for each user type's recommended elements (Amado & Roleda, 2020). Although, many research exist focusing tailored gamification in recent years (Hallifax et al., 2019b; Rodrigues et

al., 2020), there is no agreement on which game elements would be best for each user type. Since an element is used for a variety of mechanics used by different types of players (Kocadere & Çağlar, 2018), it may be useful in future studies to both determine teachers' gamification user types and examine whether there is a correlation between their game element preferences. Therefore, one may continue to be skeptical about seeking a solution to tailored gamification by blindly using the user type scale. To overcome these issues, current study attempted to one step further by determining the Hexad user types, and also getting self-response about the game element preferences of the users.

## 5.5 Suggestions for Further Research

In future research, it can be qualitatively investigated why teachers choose those game elements, thus, revealing the intentions underlying their choices. Specifically, teachers can be asked for what purpose they will use the game elements they prefer (boosting motivation, increasing achievement etc.).

Additionally, professional development activities can be prepared according to teachers' player types. This may mean that not all branch teachers receive the same professional development training. For example, mathematics teachers whose user types are achiever and disruptor will not responsible for the same professional development activities. So, this shows that if an activity is to be created within the framework of hexad user type, there should be 6 different activities for every branch. Moreover, the effectiveness of these activities and teacher satisfaction can be tested. Thus, these studies may recognize the variability of teachers and that a one-size-fits-all strategy could not have the same impact as individualized learning opportunities.

Our study did not focus on research on the game design elements preferred by each gamification user type, but such a study may be conducted in the future. Nevertheless, this study may be useful to make inferences from the fact that the user

type of the majority of the participants is philanthropist, and the most preferred game elements are reinforcement and feedback, onboarding, and relationships.

The gamification user types have been demonstrated to be influenced by age, gender, grade level, and branch, but it is vital to keep in mind that other demographics and personal traits may also have an impact on these user profiles. Culture and level of education, for instance, can be investigated. Some people may be more motivated by competition than others, depending on their cultural background, while others may be more motivated by collaboration. Similarly, persons with higher education levels might be more driven by difficult activities and complex rules, whereas people with lower education levels might be more motivated by easy jobs and unambiguous instructions. To provide a more complete understanding of the elements driving gamification adoption among educators, future research should take into account conducting a more holistic understanding of the factors influencing gamification adoption among educators.

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# APPENDICES

## A. GAMIFICATION USER TYPES (HEXAD) SCALE

| | Değerli katılımcı,<br><br>Kullanıcıların motivasyon türlerine göre sınıflandırılmasını amaçlayan bu ölçekten elde edilecek veriler sadece bilimsel amaçlı kullanılacak ve gizli tutulacaktır. Size yöneltilen bu ifadelerin doğru ya da yanlış bir cevabı yoktur. Verecek olduğunuz samimi yanıtlar daha etkili ve verimli oyunlaştırma tasarımlarının gerçekleştirilmesine yardımcı olacaktır.<br><br>Katılımınızdan dolayı teşekkür ederim. | Kesinlikle katılmıyorum (1) | Katılmıyorum (2) | Biraz katılmıyorum (3) | Ne katılıyor ne de katılmıyorum (4) | Biraz katılıyorum (5) | Katılıyorum (6) | Kesinlikle katılıyorum (7) |
|---|---|---|---|---|---|---|---|---|
| 1. | Başkalarına yardımcı olabilmek beni mutlu eder. | | | | | | | |
| 2. | Kendi yolumda ilerlemek benim için önemlidir. | | | | | | | |
| 3. | Ödül kazanabilme ihtimali olan yarışmalardan hoşlanırım. | | | | | | | |
| 4. | Önüme çıkan engelleri aşmaktan hoşlanırım. | | | | | | | |
| 5. | Başkalarıyla etkileşimde bulunmak benim için önemlidir. | | | | | | | |
| 6. | Merakımın beni yönlendirmesine genellikle izin veririm. | | | | | | | |
| 7. | Ödüller motive olmamı sağlayan önemli bir etkendir. | | | | | | | |
| 8. | Karışıklık çıkarmak için başkalarını yönlendirmek hoşuma gider. | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9. | Bir ekibin parçası olmaktan hoşlanırım. | | | | | | | |
| 10. | Alışıla gelmiş ve toplumca kabul görmüş düzeni yerli yersiz eleştirmekten hoşlanırım. | | | | | | | |
| 11. | Zor görevlerin üstesinden gelmekten hoşlanırım. | | | | | | | |
| 12. | Kendimi dik başlı ve kural tanımaz biri olarak görürüm. | | | | | | | |
| 13. | Başkalarının yeni durumlara uyum sağlamasına yardımcı olmaktan hoşlanırım. | | | | | | | |
| 14. | Bir topluluğa ait olduğumu ve orada kabul gördüğümü hissetmek benim için önemlidir. | | | | | | | |
| 15. | Çabalarımın somut olarak karşılığını almak benim için önemlidir. | | | | | | | |
| 16. | Bağımsız olarak kendi kararlarımı verebilmek benim için önemlidir. | | | | | | | |
| 17. | Yeteneklerimi sürekli olarak geliştirmek benim için önemlidir. | | | | | | | |
| 18. | Bilgilerimi başkalarıyla paylaşmaktan hoşlanırım. | | | | | | | |
| 19. | Kendimi ifade edebileceğim fırsatlar yakalamak benim için önemlidir. | | | | | | | |
| 20. | Kurallara uymaktan hoşlanmam. | | | | | | | |
| 21. | Grup halinde yapılan etkinliklerden hoşlanırım. | | | | | | | |
| 22. | Zorluklar karşısında zafer kazanmak hoşuma gider. | | | | | | | |
| 23. | Sonunda alacağım ödül tatmin ediciyse o iş için çaba gösteririm. | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 24. | Başkalarının maddi ve manevi yönden rahata ermesine katkıda bulunmak benim için önemlidir. | | | | | | | |

## B. GAME ELEMENT SURVEY

**Dersinizi oyunlaştırmaya karar verirseniz, aşağıdaki oyunlaştırma bileşenlerinden hangilerini kullanmayı düşünürdünüz? Lütfen (kullanıcı veya tasarımcı olarak) size en çok hitap eden 5 tanesini seçiniz.**

**Anlatı:** Bilgiyi, kullanıcılara tutarlı bir senaryo/hikâye üzerinden anlatma etkinliğidir.

**Kurallar:** Oyunlaştırılmış sistemin, kullanıcıların neyin yapıp neler yapamayacağını belirleyen, erişimlerini ve kullanıcı etkinliklerini kısıtlayan, yönetimsel bileşendir.

**Meydan Okumalar:** Kullanıcıların, sistem üzerinde tamamlamaları gereken ve kullanıcıyı engelleri aşmasını sağlayarak motive eden etkinliklerin/görevlerin tümüdür.

**Sistemle Bütünleşme:** Yeni veya tecrübesiz kullanıcıları, sisteme ekleme, sürece dahil etme ve sistemde kalmaya teşvik etme etkinliğidir.

**Pekiştirme ve Geri Bildirim:** Kullanıcılara, eğitim sürecindeki güncel konumlarını gösterme ve yaptıkları işlemlerin sonuçlarında geri bildirim sağlama etkinliğidir.

**Dahil Etme Döngüsü:** Kullanıcıları motive etmek ve sürece etkin katılım sağlaması için sürekli olarak güdüleyici duygular oluşturma ve devamlı olarak bu duyguları kullanıcıya aktarma etkinliğidir.

**Başarılar:** Kullanıcıların tamamladıkları görevleri gösterir, verilen soyut veya somut ödüllerdir.

**Puanlar:** Kullanıcıların diğer kullanıcılara kıyasla nerede olduklarını görmelerini sağlayan, başarılarını ölçen ve bir sonraki başarı/rozet için motive eden ögelerdir. Farklı etkinlikler ve ödüller için farklı tipte puanlama sistemleri kullanılabilir.

**Seviyeler:** Kullanıcıların sistemdeki basamaklarda nerede olduklarını gösteren ögelerdir.

**Sıralama:** Kullanıcıların sistemdeki diğer kullanıcılara göre bulundukları yeri ve ilerlemelerini görsel olarak yansıtmayı sağlayan elementtir.

**Rozet:** Başarı ve puan sisteminin daha etkili somut bir görsel temsilidir.

**Özelleştirme:** Kullanıcıların sistemi kendi tercihlerine göre kişiselleştirmesidir. Özelleştirme, motivasyonu, katılım duygusunu ve sistem üzerindeki kontrolü teşvik eder.

**Sanal Ürünler:** Kullanıcıların kendilerini ifade etmek ve yansıtmak için sistem puanları ile satın aldıkları sanal ürünlerdir. Örneğin, kullanıcıların kendilerine benzer avatarlar oluşturmak için aldıkları eşyalar kıyafetler sanal eşyalardır.

**Görevler:** Kullanıcıların tamamlaması gereken, puan kazanmak, yeni içeriklere ulaşmak ve sıralamada üst pozisyonlara gelmek için tamamlaması gereken etkinliklerdir.

**Takımlar:** Kullanıcıların diğer kullanıcılar ile iki veya daha fazla bireyden oluşan takım oluşturmaları ve rakip takımlara meydan okuma şansı tanıyan bileşendir.

**İçerik Kilidi Açma:** Kullanıcıların görevleri ve meydan okumaları tamamlayarak daha zor görevlerin ve yeni meydan okumaların içeriklerine erişim hakkı kazanmalarını sağlayan bileşendir.

**İlişkiler:** Kullanıcıların diğer kullanıcılar ile etkileşim içinde bulunmaları ve birlikte görev tamamlama, başarı kazanma, puan toplama gibi etkinlikleri tamamlamalarını sağlayan bileşendir.

Anlatı

Kurallar

Meydan Okumalar

Sistemle Bütünleşme

Pekiştirme ve Geri Bildirim

Dahil Etme Döngüsü

Başarılar

Puanlar

Seviyeler

Sıralama

Rozet

Özelleştirme

Sanal Ürünler

Görevler

Takımlar

İçerik Kilidi Açma

İlişkiler

## C. ETHICS APPROVAL FORM

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16 AĞUSTOS 2023

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

**Sayın Göknur KAPLAN**

Danışmanlığını yürüttüğünüz Merve ÖZDEMİR'in ***"İlköğretim Okulu Öğretmenlerinin Oyunlaştırma için Kullanıcı Türlerinin Belirlenmesi"*** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek 0425-ODTUİAEK-2022 protokol numarası ile onaylanmıştır.

Bilgilerinize saygılarımla sunarım.

[redacted]

Prof. Dr. Ş. Halil TURAN
İAEK Başkan