

**REPUBLIC OF TÜRKİYE
MUĞLA SITKI KOÇMAN UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED
SCIENCE**

DIGITAL GAME DESIGN AND TECHNOLOGY

**A GAMIFIED PROFESSIONAL DEVELOPMENT
MODULE FOR IN-SERVICE TEACHER TRAINING**

MASTER OF SCIENCE (M.Sc.)

FATMA YILDIRIM

JANUARY 2024

MUĞLA

REPUBLIC OF TÜRKİYE
MUĞLA SITKI KOÇMAN UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED
SCIENCE

DIGITAL GAME DESIGN AND TECHNOLOGY

A GAMIFIED PROFESSIONAL DEVELOPMENT
MODULE FOR IN-SERVICE TEACHER TRAINING

MASTER OF SCIENCE (M.Sc.)

FATMA YILDIRIM

JANUARY 2024

MUĞLA

MUĞLA SITKI KOÇMAN UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCE

APPROVAL OF THE THESIS

The thesis entitled “**A GAMIFIED PROFESSIONAL DEVELOPMENT MODULE FOR IN-SERVICE TEACHER TRAINING**” submitted by **FATMA YILDIRIM** has been unanimously accepted by the jury members of the 29th of January 2024 to fulfill the requirements for the degree of Master of Science in Digital Game Design and Technology Department,

EXAMINING COMMITTEE MEMBERS

Prof. Dr. Soner YILDIRIM (**Head of Committee, Supervisor**)
Department of Computer Education & Instructional Technology,
Middle East Technical University, Ankara

Assoc. Prof. Müge ADNAN (**Member**)
Department of Computer Education & Instructional Technology,
Muğla Sıtkı Koçman University, Muğla

Asst. Prof. Dr. Berke SOYUER (**Member**)
Digital Game Design and Technology Department,
Muğla Sıtkı Koçman University, Muğla

APPROVAL OF HEAD OF THE DEPARTMENT

Asst. Prof. Dr. Berke SOYUER
Head, Digital Game Design and Technology Department,
Muğla Sıtkı Koçman University, Muğla

Assoc. Prof. Müge ADNAN
Supervisor, Department of Computer & Instructional Technologies Education,
Muğla Sıtkı Koçman University, Muğla

Date: 29/01/2024

I hereby declare that this thesis complies with academic and scientific ethical standards. All of the results, documents, information that I have acquired and presented during my thesis studies have been acquired by me personally and within the purview of this thesis. I further declare that, in accordance with academic and scientific ethical guidelines, all original data and findings that were not discovered during the research for this thesis have been properly referenced.



Fatma YILDIRIM

29/01/2024

ABSTRACT

A GAMIFIED PROFESSIONAL DEVELOPMENT MODULE FOR IN-SERVICE TEACHER TRAINING

Fatma YILDIRIM

Master of Science (M.Sc.)

Graduate School of Natural and Applied Sciences

Dept. of Digital Game Design and Technology

Supervisor: Assoc. Prof. Müge ADNAN

January 2024, 169 pages

Gamification has proven successful across various domains, fostering a motivational learning experience, instilling lasting habits, and enhancing the overall enjoyment of processes. This research investigates the potential for educators to derive a more motivating experience through the gamification of their professional development training on digital platforms. The primary objective is to develop a gamified module design prototype aimed at cultivating a more effective and motivating learning environment, tailored to the specific needs of teachers. The study delves into the impact of gamification in adult education, specifically examining its effects on learning speed, retention, active participation, motivation, and collaborative group experiences.

The study cohort comprises 20 teachers and six mentors, participants in the TUBITAK-funded Design and Evaluation of the Effectiveness of Scientific Research-Supported Online Mentoring (e-scaffolding) Project, alongside three experts in gamification.

Employing a predominantly qualitative sequential mixed design with a small-scale quantitative component, data collection involves the Gamification User Types Scale administered to teachers and mentors. Additionally, individual and focus group

interviews with field experts, teachers, and mentors, along with observation notes recorded by the researcher as a participant observer throughout the project, contribute to the data pool. Content analysis is applied to transcribed video recordings of the interviews, while survey results are subjected to descriptive statistical analysis.

Qualitative findings highlight significant motivational triggers for teachers in digital learning environments, emphasizing the importance of feedback on their development within the training process and communication with fellow participants. Teachers' ability to monitor individual progress during educational processes emerges as a crucial developmental support. From a quantitative standpoint, the research identifies distinct player types among teachers, including achiever, philanthropist, free spirit, socializer, player, and disruptor.

The insights gained from data collection processes inform the identification of gamification elements suited to individual teacher profiles. Consequently, a gamified module prototype is developed based on self-determination theory and framed by Werbach and Hunter's D6 gamification design model. This prototype, designed for integration into diverse websites, is informed by the gamification elements determined through collaboration with the identified player types.

Keywords: Gamification, gamification in education, adult education, teacher education

ÖZET

HİZMET İÇİ ÖĞRETMEN EĞİTİMİNDE OYUNLANDIRILMIŞ MESLEKİ GELİŞİM MODÜLÜ TASARIMI

Fatma YILDIRIM

Yüksek Lisans Tezi

Fen Bilimleri Enstitüsü

Dijital Oyun Tasarımı ve Teknolojileri Ana Bilim Dalı

Danışman: Doç. Dr. Müge ADNAN

Ocak 2024, 169 sayfa

Oyunlaştırma, motive edici bir öğrenme deneyimi sunma, kalıcı alışkanlıklar oluşturma ve süreci eğlenceli hale getirme amacıyla birçok alanda başarıyla uygulanan bir yöntemdir. Bu çalışmada, öğretmenlerin dijital platformlardaki mesleki gelişim eğitimlerini oyunlaştırarak daha motive edici bir form kazanmaları incelenmiştir. Araştırma, yetişkin eğitiminde oyunlaştırmanın öğrenme hızı, kalıcı öğrenme, aktif katılım, motivasyon ve çalışma grubu deneyimlerine etkisini inceleyerek öğretmenlerin ihtiyaçlarına odaklanarak daha etkili ve yüksek motivasyonlu bir öğrenme ortamı sağlamayı amaçlayan bir oyunlaştırılmış modül tasarımı prototipi geliştirmeyi hedeflemektedir.

Araştırmanın çalışma grubu, TÜBİTAK destekli Hizmet İçi Öğretmen Eğitiminde Bilimsel Araştırma Destekli Çevrimiçi Mentorluğun (e-scaffolding) Etkinliğinin Tasarlanması ve Değerlendirilmesi başlıklı projenin katılımcısı olan 20 öğretmen ve altı mentörden ve oyunlaştırma alanında uzman üç öğretim üyesinden oluşmaktadır.

Çalışma, nitel ağırlıklı ve küçük ölçekli bir niceliksel bileşen içeren sıralı karma desen tasarımı kullanmaktadır. Veriler alan uzmanları, öğretmenler ve mentörlerle yapılan bireysel ve odak grup görüşmelerine ek olarak öğretmen ve mentörlere uygulanan Oyunlaştırmaya Yönelik Kullanıcı Tipleri Ölçeği kullanılarak toplanmıştır. Ayrıca, araştırmacının katılımcı gözlemci rolünde yer aldığı proje sürecinde alınan gözlem notları kullanılmıştır. Görüşmeler ve odak grup görüşmelerinden elde edilen video

kayıtlarının transkripsiyonu yapılarak içerik analizi uygulanmıştır. Anket sonuçları ise betimsel istatistikler ile analiz edilmiştir.

Nitel veri toplama süreci sonucunda, öğretmenlerin dijital öğrenme ortamlarındaki motivasyonel tetikleyicileri arasında katıldıkları eğitim sürecindeki eğitimdeki gelişimlerine ilişkin geri bildirimlerin, eğitimin diğer katılımcılarıyla iletişim ve etkileşimin önemli olduğu tespit edilmiştir. Öğretmenlerin bu eğitim süreçlerinde bireysel ilerlemelerini takip edebilmelerinin, onlara gelişimsel açıdan büyük destek sağladığına dikkat çekilmiştir. Araştırmanın nicel boyutundan elde edilen verilere göre öğretmenlerin oyuncu tipleri belirlenmiş, öğretmenlerin sırasıyla achiever, philanthropist, free spirit, socializer, player ve disruptor tiplerine sahip olduğu tespit edilmiştir.

Veri toplama süreçlerinde elde edilen bulgular, öğretmenlerin bireysel farklılıklarını dikkate alarak profillere uygun oyunlaştırma öğelerini belirlemeye yardımcı olmuştur. Bu belirlenen oyunlaştırma elementleri ile çalışma sonucunda, öz-belirleme teorisini temel alan ve Werbach ve Hunter'ın D6 oyunlaştırma tasarım modeliyle çerçevelendirilmiş, farklı web sitelere entegre edilmesi planlanan bir oyunlaştırılmış modül prototipi ortaya konmuştur.

Keywords: oyunlaştırma, mesleki gelişim, öğretmen eğitimi, oyunlaştırma tasarımı



Dedicated to My Dad...

ACKNOWLEDGEMENT

First of all, to my valuable supervisor Assoc. Prof. Müge ADNAN who provided me with great motivation with his sincere support and encouragement throughout my master's degree process...

To Prof. Dr. Ayşe OĞUZ ÜNVER, who always made me feel that she was always with me with her interest and support throughout my thesis process, ...

To the lecturers of the BISDEM project team and my colleagues, especially Dr. Onur Bektaş and MSc Afra Nur Altın, MSc Onur Duran ...

To Prof. Dr. Soner YILDIRIM and Asst. Prof. Berke SOYUER, who were on my thesis committee and gave me their valuable time ...

To my roommates and dear friends who accompanied me and my changing emotional states throughout my thesis process....

I offer my sincere thanks. Without your support, it would have been very difficult for me to complete this process.

My last and most special thank you would like to thank my dear family, who accompanied me unconditionally at every moment of my education life, and little Ege, who excited our family by joining us just days before my master's degree graduation.

This master's thesis was carried out within the scope of the TÜBİTAK-funded project (No. 220K080), Design and Evaluation of the Effectiveness of the Scientific Inquiry Supported Online Mentoring (E-Scaffolding) Model in In-Service Teacher Education. I would like to thank the Scientific and Technological Research Council of Turkey (TÜBİTAK) for the financial support provided throughout my graduate education.

TABLE OF CONTENTS

APPROVAL OF THE THESIS	3
ABSTRACT	iv
ÖZET	vi
ACKNOWLEDGEMENT	ix
INTRODUCTION	1
1.1 Purpose and Questions of the Study	4
1.2 Importance of Research	5
2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW	6
2.1 Game	6
2.2. Gamification and Motivation	8
2.3. Gamification Theories	11
2.3.1. Self-determination theory	12
2.3.2. The fogg behavior model (FBM)	13
2.3.3. The malone and lepper intrinsic motivation theory	14
2.4. Gamification Design	14
2.4.1. Elements of game	15
2.4.2. Gamification models	16
2.5. Player Types	22
2.5.1. Multi-user dungeons typology (MUDs)	23
2.5.2. Yee player typology	23
2.5.3. Tseng user type	24
2.5.4. The gamification player type hexad	24
2.6. Gamification in Education	27
2.6.1. Gamification vs game-based learning	29
2.6.2. Gamification in adult education	29
2.7. Prior Researches	31
3. METHODOLOGY	39
3.1. Research Method	39
3.2. Research Context	41
3.3 Study Group	43
3.3.1 Teachers	43
3.3.2 Mentors	44
3.3.3. Subject matter experts	45

3.4. Data Collection Process and Instrument	46
4.3.1. Interviews.....	48
3.4.2. Observation.....	50
3.4.3. Survey	51
3.5. Validity and Reliability	52
3.6. Data Analysis	53
3.6.1. Qualitative Data	53
3.6.2. Quantitative Data	55
4. FINDINGS	56
4.1. Cross-Case and Within-Case Analysis of Participants Interviews.....	56
4.1.1. Theme 1: Attributes	57
4.1.2. Theme 2: Context.....	60
4.1.3. Theme 3: Communication, interaction, and collaboration.....	62
4.1.4. Theme 4: Game-based learning	65
4.1.5. Theme 5: Game types.....	67
4.1.6. Theme 6: Gamification dynamics	68
4.1.7. Theme 7: Gamification elements	71
4.1.8. Theme 8: Gamification mechanics.....	73
4.1.9. Theme 9: Motivation.....	76
4.1.12. Theme 12: Technical infrastructure	84
4.2. Researcher's Observation Notes	91
4.3. Survey.....	101
5. DISCUSSION, PROPOSED MODEL, AND CONCLUSION	105
5.1. Discussion	105
5.2. Proposed Model.....	112
5.2.1. Gamified module	112
5.2.2. Proposed gamified module in line with Werbach and Hunter's D6 design framework.....	112
5.3. Gamified Module Design Prototype.....	115
5.4. Limitations.....	126
5.5. Conclusion.....	127
REFERENCES.....	130
APPENDICES	146
Appendix A (English): Expert Interview Form.....	147
Appendix B (Turkish): Uzman Görüşme Formu	149

Appendix C (English): Mentor Interview Form.....	151
Appendix D (Turkish): Mentor Görüşme Formu	153
Appendix E (English): Teacher Interview Form	155
Appendix F (Turkish): Öğretmen Görüşme Formu	158
Appendix G (Turkish): Oyunlaştırma için Kullanıcı Türleri Ölçeği.....	161
Appendix H : Permission to use the User Types Scale for Gamification	162
Appendix I: Sample Screenshot: Meta-Matrix Used for Cross-Case Analysis....	163
Appendix J: Quantitative Data Analysis Code	166
PERSONAL INFORMATION	169



TABLE LIST

Table 1. Gamification Theories.....	12
Table 2. Design Models Used In Gamification.....	17
Table 3. Gamification Player Type Hexad.....	26
Table 4. BISDEM Project's stages.....	41
Table 5. Demographic Information of Participating Teachers.....	44
Table 6. Demographic Information of Participating Mentors.....	45
Table 7. Demographic Information of Experts	46
Table 8. Data Collection Tools	47
Table 9. Theme 1: Attributes	58
Table 10. Theme 2: Context.....	60
Table 11. Theme 3: Communication, interaction, and collaboration.....	63
Table 12. Theme 4: Game-based learning	65
Table 13. Theme 5: Game types	68
Table 14. Theme 6:Gamification dynamics	68
Table 15. Theme 7: Gamification elements	72
Table 16. Themes 8:Gamification mechanics	73
Table 17. Theme 9:Motivation.....	76

Table 18. Theme 10: Supportive learning environments	81
Table 19. Theme 11: Design	82
Table 20. Theme 12: Technical infrastructure	84
Table 21. Theme 13: Usefulness	85
Table 22. Reward and motivation concepts in terms of themes, codes and participants	86
Table 23. Player types	102

FIGURE LIST

Figure 1. “Gamification” between game and play, whole and parts (Deterding, Dixon, Khaled & Nacke, 2011, s.13)	8
Figure 2. Interest in the word gamification in education over time	10
Figure 3. The Fogg Behavior Model has three factors: Motivation, ability, and triggers (Fogg, 2009)	13
Figure 4. The DMC Pyramid. Adapted from "For the win: How game thinking can revolutionize your business" (Werbach & Hunter, 2012)	15
Figure 5. Chou’s octalysis model (Chou, 2013)	20
Figure 6. Hook model (Eyal, 2015)	21
Figure 7. Gamification player type hexad (Marczewski, 2015)	25
Figure 8. Research design	40
Figure 9. Data collection process	47
Figure 10. Stages followed in analysis of interview data in a study on the evaluation of teacher performance (Collins, 1999)	54
Figure 11. Themes and Codes	57
Figure 12. Scheme of player types categories	102
Figure 13. Scheme of average for each category	103
Figure 14. Scheme for transferring participants' professional development processes to online platforms	107

Figure 15. Diagram of participants' evaluation of the effect of gamification on teacher education	108
Figure 16. Login and registration page	116
Figure 17. Feed	116
Figure 18. Time counter	117
Figure 19. My updates	119
Figure 20. My courses.....	120
Figure 21. Collaboration request.....	121
Figure 22. Support.....	122
Figure 23. Expert support.....	123
Figure 24. My report	124
Figure 25. My report - badges.....	124
Figure 26. My report – badges	125
Figure 27. My report – feedback.....	126

INTRODUCTION

The increasing use of digital technologies in education has been the subject of research and debate for many years. From past to present, many studies have been conducted on the effectiveness of various teaching tools. In particular, games that can be integrated into teaching processes are recognized by educators as an effective tool (Gee, 2003; Habgood, 2007; Prensky, 2001). Educational environments are considered to be suitable environments for games and game-like elements (O'Donovan, 2012). In this context, it has been emphasized that gamification has positive effects on motivation and the popularity of gamification applications in education has increased.

Gamification in education is widely used in applications focusing on the personal development of individuals to increase motivation and make the learning process fun. For example, people who want to improve and practice their language skills can apply to Duolingo, while those who want to receive training on subjects such as deep learning and digital marketing from leading universities can apply to online platforms such as Coursera (Duolingo website, 2024). Basic gamification elements are frequently encountered in these online applications.

When we focus on gamification in the learning process, another point that attracts attention is that the applications are generally student oriented. Teachers frequently use applications such as Kahoot, ClassDojo, and ClassCraft during lessons to increase student participation, make learning more interesting, and encourage in-class interaction (Kahoot website, 2024; ClassDojo website, 2024; ClassCraft website, 2024). However, the lack of similar details about gamification in platforms for teachers' professional development is striking. Research and practices in this field require further efforts to examine how gamification can be used effectively in teachers' professional development processes.

Further research and practice on how gamification in education can be integrated into teachers' professional development may allow us to fully explore the potential in this

field. Teachers' access to gamified tools focused on their own development and guidance on how to use these tools effectively marks a point where gamification in education can offer value not only for students but also for teachers.

Especially when we focus on the professional development of teachers, the recent education trends towards digitalization create an opportunity for the applicability of gamification in teacher training. Gamification of professional training for teachers in digital environments, how it can contribute to teachers and how teachers react to this approach is an important research area. In this transformation process, teachers' concerns about this new education model should be taken into account.

Education on digital platforms provides teachers with flexibility and accessibility, offering them the opportunity to learn at their own pace and in a way that suits their needs. At the same time, they can benefit from the advantages of gamification in motivating teachers, building habits and creating a sustainable learning environment. Therefore, more research and practice is needed on how gamification can be effectively applied in teacher training and how teachers can integrate into this new education model.

At this point, gamification strategies in education can increase teachers' participation in professional development trainings carried on digital platforms and strengthen their motivation. Gamification can provide the opportunity to make educational processes more interactive and entertaining, enabling teachers to experience training offered on digital platforms more effectively. By making learning experiences more interactive and fun, this method can motivate teachers, increase their participation, and make their learning processes more effective. For this reason, it is thought that providing teachers with gamified training on digital platforms may provide both the potential to contribute to the professional development of teachers and the opportunity to provide students with a more effective education.

The suggestions offered by gamification in education to learning processes focus on its potential to provide solutions to the learning needs that arise especially in digitalized educational environments. According to some studies in the literature, traditional education methods may be limited in considering students' individual learning styles and speeds (Hattie, 2009). In order to respond to students' different learning needs, digitalized educational environments provide flexibility by focusing on adaptive

learning and student-centered strategies (Steinkuehler et al., 2012; Gee, 2003).

Gamification strategies in digitalized learning environments can enrich learning processes by offering interactive experiences to students and focus more on the needs of the learner (Sailer et al., 2017; Hamari et al., 2014). These strategies have the potential to make learning more effective by providing students with customized learning materials, tracking their progress levels, and providing instant feedback (Deterding et al., 2011).

In this context, the importance of teachers finding solutions that are suitable not only for their students but also for their own teaching practices can be emphasized. Using gamification in teacher training can provide teachers with the opportunity to develop interactively on digital platforms and in accordance with their learning speed. This approach can support teachers to guide their students more effectively, as well as continue their professional development process.

The future role of gamification in education will continue to be an important focus, with the potential to make learning experiences more interactive and participatory. Researchers emphasize that technological developments, especially artificial intelligence, augmented reality and virtual reality, can further strengthen gamification in education (Deterding et al., 2011; Hamari et al., 2014). In this context, new and innovative gamification strategies will come to the fore in terms of offering students customized experiences, improving their skills in solving real-world problems, and encouraging collaborative learning (Yıldırım, 2016).

On the other hand, the future role of gamification in education is not limited to technological advances. Researchers should also consider social and psychological factors in terms of gamification enriching teacher education processes, increasing student motivation, and making learning environments more effective (Nicholson, 2015). It is expected that future research will focus on developing gamification strategies that are more sensitive to student and teacher needs. Therefore, the evolution of gamification in education will move towards the adoption of a student-centered, adaptive approach that supports the professional development of teachers along with technological innovations. In the future, developments in this field are expected to lead to more effective and sustainable results in education by encouraging greater participation of students and educators in the learning processes.

1.1 Purpose and Questions of the Study

The main purpose of this study is to support making teacher training more motivating and effective by using gamification. In line with this goal, a prototype of a gamification module design that supports teacher trainings conducted on different digital platforms was created. The main context is an innovative in-service teacher training initiative realized within a nationally funded project.

This study was carried out in connection with a TUBITAK-funded Designing and Evaluating the Effectiveness of Scientific Research Supported Online Mentoring (e-scaffolding) in In-Service Teacher Education Project (Project No. 220K080). In order to form the basis of the designed gamification module prototype, the opinions and experiences of experts in the field of gamification in education as well as the teachers and mentors participating in this project were taken.

The following questions will be answered in the study.

1. What are the participants' (teachers and mentors) views on the professional development processes carried out on the digital platform?
2. What are the participants' (teachers and mentors) views on the strengths and weaknesses of teacher education activities carried out on online platforms?
 - 2.1. What are the strengths and weaknesses of these activities?
 - 2.2. What are the motivational strengths and weaknesses of these activities?
3. How do the participants (teachers, mentors and experts) consider the influence of gamification on teacher education?
 - 3.1 How gamification may contribute to the interaction in teacher training?
 - 3.2 How gamification may contribute to motivation in teacher training?
4. How are participants' preferences for different game design elements affected by their player types?
5. What kind of gamification system can be put forward to improve teacher training activities conducted on digital platforms?

1.2 Importance of Research

When we look at the literature, it is observed that teachers' wants and needs on digital platforms have been identified with different methods. However, there are no gamification proposals that would provide a more motivating form for teachers' professional development on digital platforms in line with these needs. In this context, this proposal, which is designed for teachers, makes an important contribution to the study by determining the player types of teachers and offering a teacher-oriented gamification design proposal by taking these player types into consideration.

This research was conducted within the scope of Designing and Evaluating the Effectiveness of Scientific Inquiry Supported Online Mentoring (E-Scaffolding) Model in In-Service Teacher Training Project supported by TÜBİTAK. The project includes a digital in-service training. The researcher took part in the execution of the digital processes of the project. She took on roles such as supporting teachers and mentors to manage digital processes, facilitating the use of the web platform and helping them to carry out tasks through the platform. Conducting the research within the scope of the project reveals a unique dimension of the study.

The unique features of the study are that the researcher was in the role of participant observer, experienced the digital education process with teachers during two learning periods, and strengthened the data obtained by using more than one data collection method in the study.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

This chapter presents a literature review on the emergence of gamification, its relationship with motivation, gamification theories, gamification design models, and player types.

2.1 Game

Game has historically existed as a universal phenomenon across different cultures and time periods. This phenomenon has profoundly affected the social and cultural structure of humanity and made significant contributions to the evolution of societies. As Wittgenstein (1976) stated, it is not possible to limit the concept of "game" to a single definition.

Johan Huizinga's (1980) work "Homo Ludens: An Essay on the Social Function of Game" emphasizes that game is a source of social power and dynamism, beyond being just entertainment or a leisure activity. Game plays a fundamental role in the cultural evolution of human communities and is an effective element in the formation of social order and norms. The concept of "magic circle" defined by Huizinga represents a special area where the time and space in the game are separated from the real world. Participants interact within the framework of the rules determined within this "magic circle", thus the basic features of the game such as freedom, rule-basedness, creating a separate field of reality and voluntary participation emerge. Recognizing that game is a tool that strengthens people's creativity and deepens their social relations offers an important perspective on the cultural development of societies.

Games are defined by a single word in Turkish; "play," In English, it is equivalent to two concepts: "play" and "game." According to the Turkish Language Association, "play," "game," defined as something fun with specific rules that develops ability and intelligence, provides a good time, and is fun, while "game," is defined as any activity that is not related to a purpose and a sense of progress, and that gives pleasure (Turkish

Language Association [TDK], 2022). The reflection of the fundamental difference between these two concepts in Turkish is that "play" "game" is entertainment that is created at one's own will and is not subject to any rules, whereas "game" is entertainment that is purposeful, within a certain framework and rules.

Another definition of game is as an activity in which one or more players participate, with specified goals, rules and results (Dempsey et al., 2002). The game can also be thought of as a competition that contributes to the physical and mental development of individuals (Fiş Erümit, 2016). This activity allows children and the elderly to spend their free time in a fun way and to relax (Keskin, 2009). Although games were initially perceived as a means of entertainment for children, over time they were adopted and played by people of all ages (Yıldırım, 2016).

Especially with the acceleration of technological developments, games have entered a different evolution process and started to appeal to wider age groups (Dominguez et al., 2013; Kuutti, 2013). This change indicates that games have become a part of the lifestyle, rather than just an entertainment element specific to childhood (Hoon et al., 2002). Games, rather than being seen as a means of getting away from real life and having fun, have gained a place in real life by continuing their existence in the digital world.

Today, with technological advances, games play an important role in cultural interaction by reaching a wide audience in different formats and platforms. These games go beyond just entertainment, they also contribute to the development of important skills such as learning, collaboration and communication. Games adapt to the dynamics of modern society, deepen interpersonal relationships and create a new social interaction platform.

In this context, games are seen not only as a source of entertainment, but also as a powerful tool for social development and cultural enrichment. The concept of "gamification", introduced by Jesse Schell in his presentation titled "The Future of Games" in 2010, offers the perspective of integrating the character and lifestyle of the game into real-life experiences, beyond playing a character in games set in the virtual world (Xu, 2011). In this way, games allow individuals to integrate the experiences they gain from the virtual world with real life, and also play an effective role in social interaction and cultural development.

2.2. Gamification and Motivation

Since 2008, expressions symbolizing gamification have been used in different forms, such as "productivity games" by McDonald, Musson and Smith (2008), and "surveillance entertainment" by Grace and Hall (2008). However, these terms were first used by game designer Nick Pelling in 2002 (Marczewski, 2013; Werbach & Hunter, 2012). However, no framework for gamification rules has been created in these years.

When we focus on the period after 2010 to understand the concept of gamification, which is extremely popular today, we can observe that there is no clear definition of gamification, and many experts define it in different ways.

Deterding et al., (2011) prepared a chart explaining the definitions of gamification and the distinguishing features of similar concepts (Figure 1). One of the concepts included in the figure is serious games. There is no big difference between serious games and gamification. What distinguishes gamification from serious games is that the targeted behavior in serious games is experienced in an environment similar to the real world. The virtual world is not always created in a gamified application and is often implemented in daily life. Serious games have gameplay in their environment and have gamification elements in the game (Deterding et al., 2011). While gamification is a process of learning by having fun and learning (Ar, 2016), serious games are games played for a specific goal beyond pure entertainment (Azadegan et al., 2012).

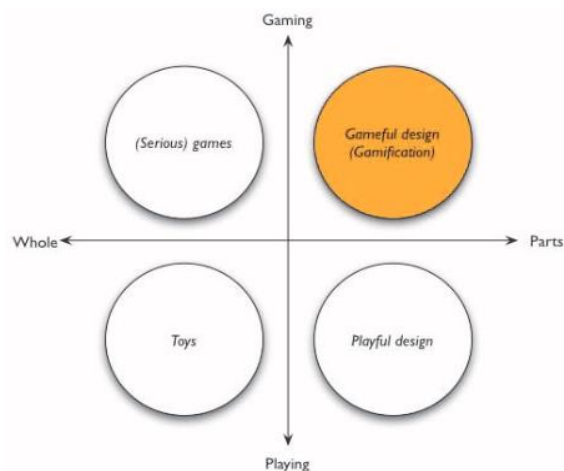


Figure 1. “Gamification” between game and play, whole and parts (Deterding, Dixon, Khaled & Nacke, 2011, s.13)

According to Deterding et al., (2011), gamification is the use of game dynamics, mechanics and components in systems whose starting point is not a game (Deterding et al., 2011).

In a similar definition, it is expressed as the use of game elements in non-game environments to solve problems and increase motivation and commitment (Werbach & Hunter, 2012; Zichermann & Cunningham, 2011). What these definitions have in common is the deliberate addition of game elements to contexts that do not normally contain game elements, thus providing a game-like experience.

Brigham (2015) defined the concept of gamification as “an attempt to positively influence knowledge, motivation, learning and problem solving by using game elements and strategy”. Gamification provides users with an active experience process and encourages the user to participate more in the process (Güler, 2015).

On the other hand, Chou (2013) sees games as environments used for entertainment purposes and states, "If you integrate the mechanics of games into products and platforms instead of game environments, then it becomes gamification" (Chou, 2013). In this way, he states that by applying gamification to different platforms, the entertainment aspect of the game can be reflected in these environments.

With these definitions evolving over time, the application areas of gamification appear as a comprehensive concept that spans a wide range from business to education, from healthcare to marketing. In this context, the evolution of gamification and its importance today are gradually increasing.

Gamification is used to create a positive change in consumer behavior in marketing (Hamari, 2013), to help users gain sports and healthy eating habits in health applications (Deterding et al., 2011), to achieve learning goals in educational applications, to create loyalty, to increase work efficiency in business life applications, It has begun to be applied in many areas for different purposes, such as turning it into an entertaining form (Nelson, 2012; Oprescu et al., 2014), and over time it has become a common method. Especially in the field of education, when the keyword "gamification in education" is searched in Google Trends, it is seen that this group of words was first searched in 2004 (Figure 2). It has become a popular application area as of 2013.



Figure 2. Interest in the word gamification in education over time

Gamification is the process of creating game-like experiences by increasing motivators to achieve behavioral changes (Hamari et al., 2014). With gamification, people can acquire new habits. Yılmaz (2018) supports this with the idea that if a problem arising from lack of motivation in any field is tried to be solved by giving the user a long-term habit with one of the game elements, we can observe that gamification is applied in this field. In addition to all this, Kapp (2012) says that it can also change the way people think.

In 2011, Gabe Zichermann said 75% of gamification is psychology, and 25% of that is new technologies. This sentence states that psychological factors should be considered in the game-making practices. Motivation, which is a trigger for a purpose, is one of the elements that is based on many definitions of gamification.

Motivation is incentivement, encouragement, aspiration, mobilization to perform an action, initiating, directing, and maintaining targeted behaviors (Hong & Masood, 2014). The literature shows that motivation is divided into internal motivation and external motivation. According to Kapp (2012), understanding the relationship between the two types of motivation is important for gamification.

Intrinsic motivation, it is the case that an individual performs the action at his own request. It is often the subjective and abstract motivation that the individual ignores external factors (Hong & Masood, 2014). The motivation for learning and achievement in the natural environment (Ryan & Deci, 2000). Internal motivation helps the individual react more strongly in the face of unexpected and complex events. This makes learning even deeper, and the results are more creative (Lepper, 1988). In this type of motivation, learning or winning a behavior occurs with internal trends such as liking, enjoying.

Extrinsic motivation, actions taken by an individual to win awards or avoid punishment against their will (Alioon, 2016). Motivation occurs with external factors in the individual. For example, at the end of a course in a school environment, a student can create a source of praise, reward or certification from their teacher. If the student does not wish to successfully complete this course process, but the result increases the desire to complete the course due to these possibilities, this indicates external motivation. The external motivation comes from many points in everyday life.

According to Şahin and Şamur's research, when examining the thesis studies in YÖKTEZ and EBSCO between 2013-2015, the most studied dependent variable is motivation. In addition, when related studies are scanned in the literature, there are studies that reveal evidence that gamification has a positive impact on the motivation element (Bolat et al., 2017; Bozyer & Bağcı, 2018; Buckley & Dolye, 2016; Hamari et al., 2014; Hanus & Fox, 2015; Hong et al., 2014; Sailer et al., 2017; Mekler et al., 2017; Meşe, 2016; Seaborn & Fels, 2015).

In the study conducted by Hamari, Koivisto, and Sarsa (2014), 24 different studies were examined and most of the studies examined revealed that gamification has positive effects on learners. Similarly, Seaborn and Fels (2015) examined 32 studies on gamification in different disciplines and concluded that gamification has positive effects on learners. In line with these findings, it is one of the inevitable facts that gamification applications are interesting and motivating for learners who grow up in the interactive digital age (Glover, 2013).

2.3. Gamification Theories

Gamification theories offer fundamental principles for understanding user motivation, designing reward systems, effectively integrating game dynamics, and achieving targeted behavioral changes. These theories draw from various disciplines and can be customized according to the application context, thus helping to create a successful gamification strategy. The three most used of these approaches are Self-Determination Theory, Fogg Behavior Model and Malone-Lepper Intrinsic Motivation Theory.

Table 1. Gamification Theories

Gamification Theories
Self-Determination Theory
Fogg Behavior Model
Malone Motivation Theory
Flow Theory
Social Learning Theory

2.3.1. Self-determination theory

Self-Determination Theory is a theory that takes into account the external and internal motivation problems of individuals. It is said that the ability of people to reach their full potential depends on basic psychological needs such as autonomy, competence and relatedness (Ryan & Deci, 2000).

Autonomy means individuals' ability to act according to their own will and make their own choices (Freeman & Anderson, 2011). Competence is defined as the motivation of the individual to perform any job he/she wants and the desire to influence the people around him/her (Deci & Ryan, 2000); relatedness is defined as the individual's need to be in contact with other people.

Deci and Ryan (1985), one of the founders of Self-determination Theory, categorized motivation in four headlines. These are:

1. The intrinsic motivation is the self-motivated state of an individual who is subjective, independent of external factors (Hong & Masood, 2014).
2. Self-determined extrinsic motivation defines the willingness to participate in a process due to personal preferences. For example, it is a desire to participate in an event that is valued and important.
3. Extrinsic motivation that cannot be determined by self, it is the type of motivation that drives the action by being influenced by rewards or restrictions.
4. Lack of motivation, in the event of non-motivation, there is no need for purpose or causality in behavior (Ryan & Deci, 2000). It means that

individuals do not embrace the action and feel in their own control (Kowal & Fortier, 1999).

2.3.2. The fogg behavior model (FBM)

The Fogg Behavior Model (FBM) gives designers and researchers a way of dealing with the underlying factors of behavior change. These factors are motivation, the motivation required for the target behavior; ability, the ability of the person to acquire the targeted behavior; trigger is expressed as triggering the person to take action for the targeted behavior (Fogg, 2009). The Fogg behavior model and its dependent variables are shown in Figure 1.

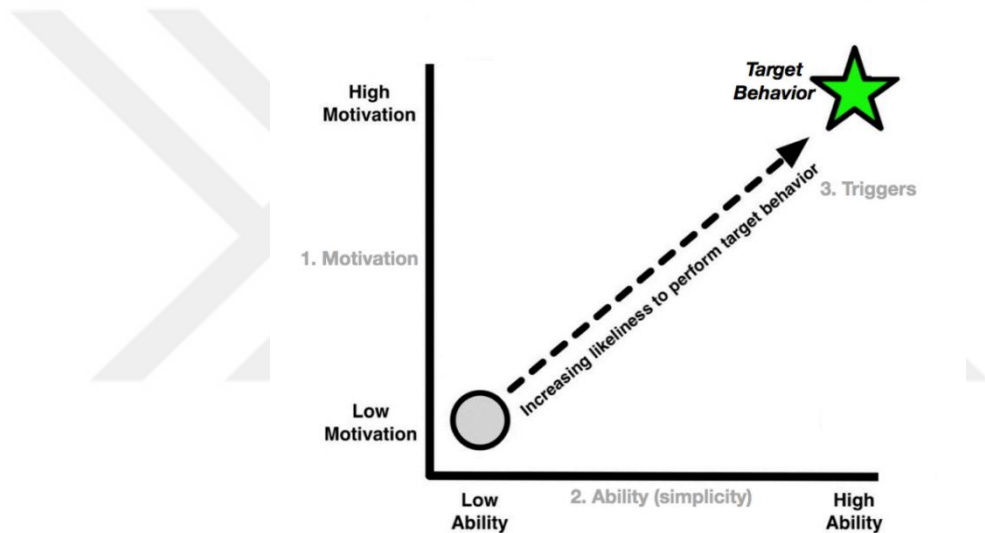


Figure 3. The Fogg Behavior Model has three factors: Motivation, ability, and triggers (Fogg,2009)

Figure 1 has no units; it represents a conceptual relationship. Its components are motivation, skill, and trigger. Its vertical axis indicates motivation, its horizontal axis indicates ability, and the star indicates targeted behavior. For a behavior to occur, all three elements must be present at the same time. Increasing the horizontal and vertical levels will increase the probability of the targeted behavior, but it should be a trigger for the behavior. Even if the individual is motivated and has high abilities, the desired behavior cannot be realized if there is no necessary trigger (Fogg, 2009). According to Fogg, if the targeted behavior is not realized, one of the elements of motivation, ability, and triggers is missing.

2.3.3. The malone and lepper intrinsic motivation theory

The model of Malone and Lepper Intrinsic Motivation Theory was created by considering educational computer games. It is an instructional design focused on intrinsic motivation. When people can provide their intrinsic motivation, they can perform higher in unexpected conditions and events and become more resistant to inconsistencies and confusion. In this way, the learning becomes deeper, and the results are more creative (Lepper, 1988). This theory consists of struggle, curiosity, fantasy, and control elements. Struggle is the individual's gaining self-esteem and self-efficacy while going to the goal at different levels of difficulty; curiosity, taking into account the current situation of the individual, transferring the appropriate level of information and making the interaction between the individual and the environment interesting for the individual; fantasy is expressed as creating an imaginary environment or an extraordinary environment regarding the learned material, making the individual think that he is in that environment, and control, the individual's having a choice, and the ability to use his authority over different options (Malone & Lepper, 1987).

2.4. Gamification Design

Gamification design is the process of making sense and associating things related to the game. Gamification design models are a guide in the gamification process (Almarshedi et al., 2015; Chou, 2015; Eyal, 2015; Werbach & Hunter, 2012; Kumar & Herger, 2013; Wu, 2011; Zichermann & Cunningham, 2011). Some of the design models reflect the inner worlds of people (Almarshedi et al., 2015; Chou, 2015; Wu, 2011; Zichermann & Cunningham, 2011), while others reflect the company goals (Eyal, 2015; Kumar & Herger, 2013; Werbach & Hunter, 2012). In gamification, internal interactions, interactions between game elements, external interactions, interaction between gamification elements and the individual are important.

Sometimes, users are initially willing to participate in the systems where gamification is being implemented, but they are gradually moving away from the system due to lack of motivation (Huizinga, 1980; Werbach & Hunter, 2012). The main reason for this is that the system does not have a successful gamification design. The importance of the gaming processes is clearly apparent because the system failed (Rapp, 2015;

Schönbohm & Urban, 2014) due to the lack of design (Cassells, Broin & Power, 2015).

2.4.1. Elements of game

The definition of the gamification components is conceptual and can be observed that gamification consists of gamification thinking, gamification interaction and gamification design (Deterding, 2012; Kapp, 2012). Here is a brief review of the gamification dynamics, mechanics, and components of Werbach and Hunter (2015), the key elements of the gamification design in the gamification pyramid.

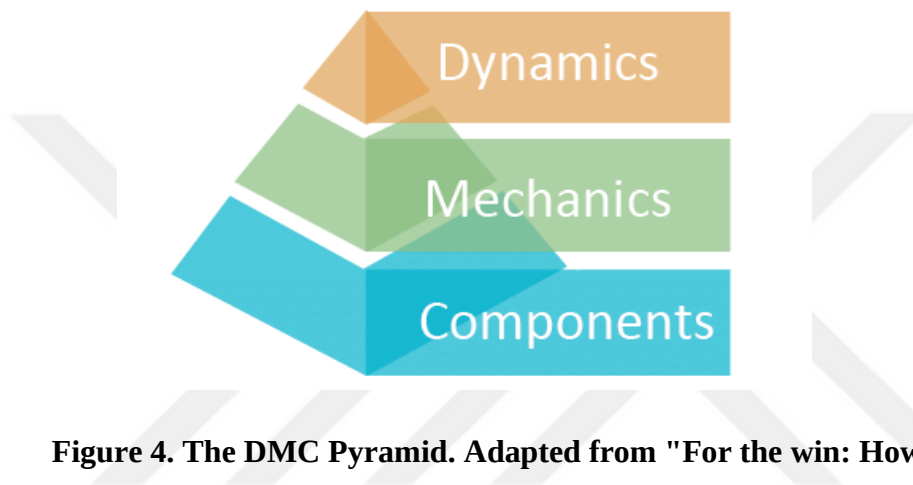


Figure 4. The DMC Pyramid. Adapted from "For the win: How game thinking can revolutionize your business" (Werbach & Hunter, 2012)

Game mechanics, includes elements that cover the overall game, focusing on activities within the gamification structure and the behavior of the player (Werbach & Hunter, 2015). Mechanics help the individual to internalize the matter. Providing the motivation to get the player to move is the part that drives the game, such as the player's connection to the game (Bozkurt & Genç Kumtepe, 2014; Bunchball, 2010). It is the component with various elements for the spatial process (Zichermann & Cunningham, 2011). Some of these elements are (Bunchball, 2010; Werbach & Hunter, 2012):

1. Chance,
2. Challenges,
3. Cooperation and competition,
4. Feedback,
5. Rewards,
6. Resource acquisition,

Game dynamics can be said to be the core structure of the gamification design. Examples include motivation, desire, emotion, and so on, which have been uncovered by gamification mechanics. These examples are:

1. Fiction elements,
2. Rewards,
3. Achievements,
4. Associations,
5. Relations
6. Progress,

it can be increased as well. Dynamics are the basis for the player's interaction with game mechanics (Schönen, 2014; Werbach 2016, Zichermann & Cunningham, 2011). Focus is on turning the game into a more fun form for the player (Wu, 2011). Dynamics are the key to the effect of gamification on the player. Dynamics are key to a successful design (Werbach & Hunter, 2012).

Game components are design elements that enable the interaction of game mechanics and dynamics with the user (Güler, 2015). These components (Werbach & Hunter, 2012):

1. The avatars,
2. Badges,
3. Challenge,
4. The collections,
5. Leadership chart,
6. The levels,
7. The points,
8. Tasks,
9. The teams,
10. Virtual goods,

2.4.2. Gamification models

Gamification design is the process of making sense and associating things related to the game. Gamification design models are a guide in the gamification process

(Almarshedi et al., 2015; Chou, 2015; Eyal, 2015; Werbach & Hunter, 2012; Kumar & Herger, 2013; Wu, 2011; Zichermann & Cunningham, 2011). Some of the design models reflect the inner worlds of people (Almarshedi et al., 2015; Chou, 2015; Wu, 2011; Zichermann & Cunningham, 2011), while others reflect the company goals (Eyal, 2015; Kumar & Herger, 2013; Werbach et al., 2012). In gamification, internal interactions, interactions between game elements, external interactions, interaction between gamification elements and the individual are important.

Table 2. Design Models Used In Gamification

Design Models Used in Gamification
D6 Design Model
Chou's Octalysis Model
Hunicke, LeBlanc & Zubek / Zichermann & Cunningham's and MDE Framework
Kapp's Gamification Approach
Hook Model
SAPS Reward Theorem
The Framework for Sustainable Gamification Impact
Player Centered Design Model

2.4.2.1. D6 Design Model

The D6 design model was created by University of Pennsylvania professors Werbach and Hunter. Werbach has proposed a gamification pyramid (Figure 4) showing how gamification can be applied in different ways. But this gamification is more than just the elements in this pyramid. The main observable result of gamification is learning experience and gaining habits. Game aesthetics, on the other hand, are the features that create a perception of reality for the learner (Werbach, 2016) and the emotional reactions of the learner as a result of his interaction with the gamified system.

The model consists of 6 steps and the title of each step begins with the letter "D". These steps are respectively.

1. Define business objectives: Determining the objectives exactly for the purpose. It is important that these goals are clear and cle understandable. It must be stated in the direction of these objectives why the engraving should be used.
2. Delineate target behaviors: Determining appropriate behaviors and evaluation criteria for these behaviors. The behaviors identified must be targeted. Incorrect behaviors should be corrected, targeted behaviors should be supported by game elements such as badges, points, etc.
3. Describe your players: Setting player types is a step that should not be ignored so that the gamification application can deliver a positive target result. So, analyzing the learner and determining the motivating elements, taking into account the differences of the elements that motivate the learner. If the application area is large, it will be a great advantage if it is in a customizable, flexible form for this audience.
4. Devise activity cycles: Designing activity cycles that can motivate the learner to ensure continuity in the learner's actions. Activity cycles consist of two different categories. These are:
 - 4.1. The flow chart of the process must be created during the engagement cycle phase. It should be determined which steps the player will follow in the system, what actions they will take, why they will do it, and what answers they will receive based on their fulfillment.
 - 4.2. In this loop, the player follows the flow. In the progress cycle, they are at the stage of the process, focusing on making a positive impact on the user's long-term learner motivation for what they can gain.
5. Don't forget the fun: Not skipping the fun element for the continuity and volunteering of the learner. It is primarily a step in the user interface that should be considered in areas where interaction is high. The fun of the app will increase user loyalty. The application should also be based on internal motivation, except for external motivations such as reward, punishment. Fun types can be diversified, considering personal differences.

6. Deploy the appropriate tools: Implementation of appropriate game items and other planned steps. This step starts to play with the targeted process, activity loops and tools that match the type of entertainment.

2.4.2.2. Chou's Octalysis Model

The octalysis model, developed by Chou in 2015, was based on player motivation. The name of this model comes from a combination of octagon and analysis. According to this model, gamification consists of eight types of motivations based on some impulse and emotions, such as meaning, empowerment, social impact, predictability, evidence, scarcity, ownership, and accomplishment (Chou, 2019). These types:

1. Epic meaning & calling: The player thinks he's a chosen man or he's doing great things. The main motivation of the player is to be an important person or to be part of an important group.
2. Development & accomplishment: The key motivation of the player is based on internal motivations. It is very important to be able to move forward in the game, develop skills, and successfully complete challenges.
3. Empowerment of creativity & feedback: In this type of motivation, the opportunity for the player to be able to experience new things and express their creativity is needed. They also want to see feedback on the consequences of what they produce as a result of their creativity.
4. Ownership & possession: The player's sense of virtual objects and dominance in the game increases the motivation of continuity in the game. Ownership is important for this type.
5. Social influences & relatedness: Such urges like interacting with other players, building social relationships, being friends, competing motivate this type.
6. Scarcity & impatience: The player is motivated by a rare, difficult to achieve in the game. This increases player continuity.
7. Unpredictability & curiosity: The player is motivated by curiosity because he doesn't know what will happen next. It's one of the reasons he's involved in gambling and lottery.
8. Loss & avoidance: It is a situation where the player is avoiding the possibility of a negative situation in play that will affect the outcome of the game. It's the

motivation to not miss out on any opportunity in real time to experience the negative.

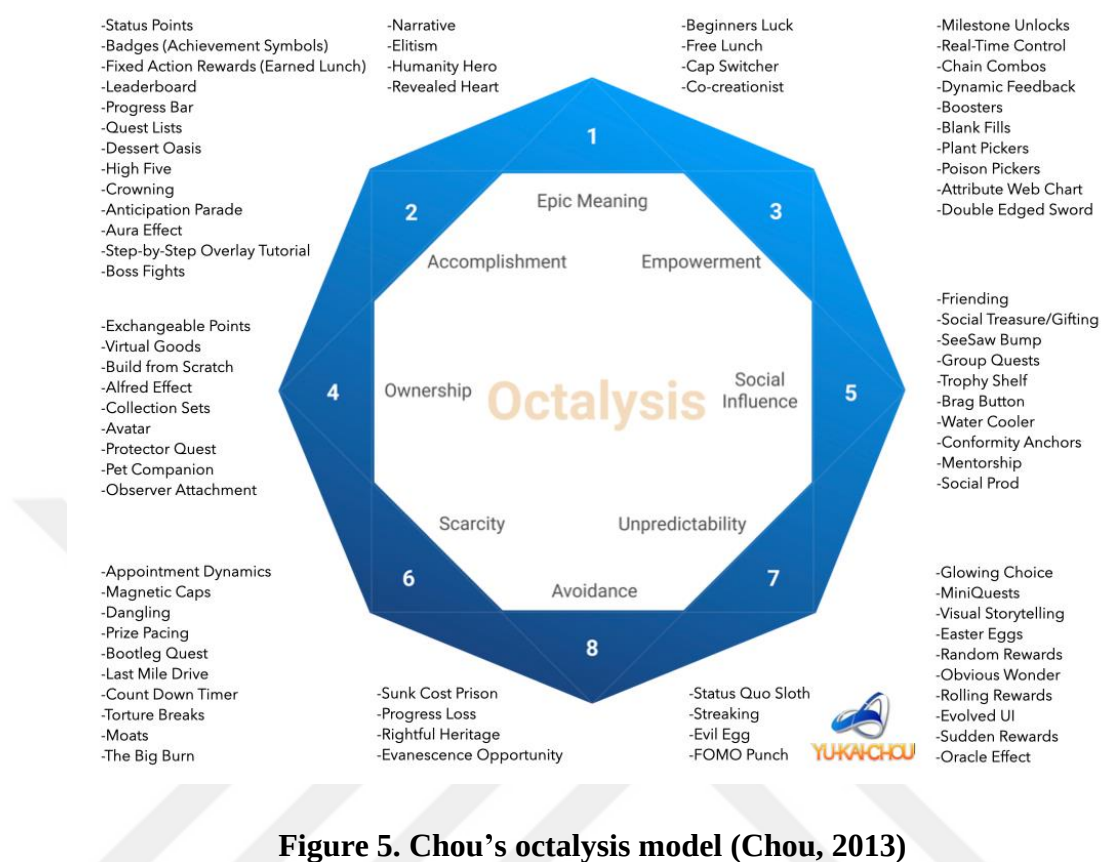


Figure 5. Chou's octalysis model (Chou, 2013)

In Figure 5, we can observe that the types of motivations that are based on the gamification elements and the Octalysis model are correlated. Chou evaluates this shape in two different ways. The left-hand side of this frame represents the left-hand side of the brain and the right-hand side of the brain. The left is based on logic, ownership and analytical thinking associated with external motivation, while the right is based on internal motivation, creativity, and social relationships. Other than that, the top of the image includes “White Hat Gamification”, the bottom part “Black Hat Gamification” techniques and motivation elements. The upper part consists of positive motivational elements such as the user feeling strong and happy, the lower part consists of negative motivational elements such as the user's feeling of anxiety and lack of belonging (Chou, 2019).

2.4.2.3. Hook Model

The hook model aims to make a habit of the player. The model also describes the

relationship behind the achievements achieved through this behavior in real life (Eyal & Hoover, 2015). The stages of the four-stage model are:

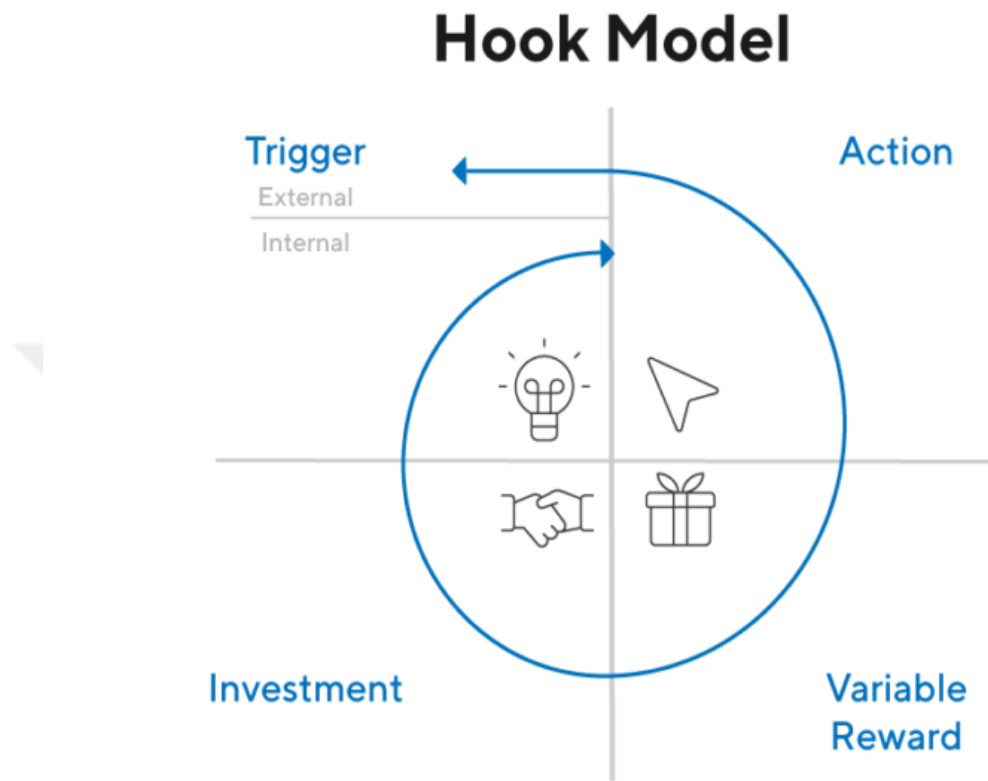


Figure 6. Hook model (Eyal, 2015)

1. **Trigger:** It is the power that aims to make the player move. Triggers can be categorized internally and actually in two headings. Intrinsic triggers are the case that the player, independent of external factors, is triggered by feelings such as curiosity, anxiety. Extrinsic triggers are interventions by their managers in the universe where they are located in the form of advertisements, notifications (Wood & Neal, 2007).
2. **Action:** It is all the behaviors of an user who is motivated in line with the prize expectation.
3. **Variable Reward:** In order to maintain the player's game continuity, methods such as badges, status, virtual rewards must be used. Eyal (2015) categorizes the awards in three titles. These are:

- 3.1. Tribe rewards are for social relationships and collaboration.
- 3.2. Hunt rewards are the rewards that the player faces in his quest to gain access to information.
- 3.3. Self-rewards are the rewards that the player will internally motivate and overcome existing obstacles and make himself happy with their own competence.
4. Investment: This stage is the whole of the behaviors that the player has achieved in thinking of the rewards they can achieve for the product or service at a later time (Eyal, 2015; Yılmaz, 2016).

2.5. Player Types

According to Caillois (2001), the results of the games are based on the players. It can be observed that not every player has the same behavior during play (Yee, 2006). This is because there are psychological-based competencies that differentiate players from each other, interests, lifestyle-dependent factors, factors that depend on the culture of their geography, and also demographic factors such as age, gender, occupation, social lifestyle, education status (Hamari & Tuunanen, 2014; Prensky, 2001).

It is important to know the target group to be user-focused in learning processes. There are different models that define player types when looking at literature (Natural et al., 2017; Hamari & Tuunanen, 2014). The continuity motivation in the game was one of the focus factors when these models were created (Marczewski, 2015; Tseng, 2011).

These models are available in order:

1. Multi-user dungeons typology (Bartle, 1996)
2. Yee player typology (Yee, 2006)
3. Tseng player typology (2011)
4. The Gamification Player Type Hexad (2015)

2.5.1. Multi-user dungeons typology (MUDs)

The first study to determine the historically known player typology was conducted by Richard Bartle in 1996. Bartle's model has four player types. These are (Bartle, 1996):

1. The Socializers like to communicate and interact with their group friends.
2. Explorers like to dominate the game and explore different ways in play.
3. Achievers like to achieve goals, win awards, and rise in the game.
4. Killers are the group that always has their priorities, enjoy hurting other players and focus on crossing them.

2.5.2. Yee player typology

Nick Yee based on statistical data that he studied from MMORPG players in 2002, five players set a type of motivation (Nacke et al., 2014; Yee, 2002). These types:

1. In social terms,
2. A state of self-control, a state of immersion,
3. Use others for their own benefit,
4. The focus of success
5. The focus of leadership

However, in 2006, Bartle's player typology was reconstructed by taking the motivation element to the center and introduced a new typology of three types of motivation (Yee et al, 2012). If the player types in this typology are:

1. For those who have achievement in motivation: The concepts of status, power and competition are important. Being able to move forward in the game, dominating other players, motivates this type.
2. For those who have social motivation: Being in touch with other players in the game is motivating to support them. They tend to team this type of player.
3. For those who have immersion in motivation: The game's fiction, story and roles are important. They are motivated by the fact that the game has elements that they can personalize, like the character's exterior.

2.5.3. Tseng user type

In Tseng 2011, he did a study where online players looked at their motivation in online games. This study has revealed that there are two factors that affect the motivation factor. These factors are the need for exploration and victory. In connection with this, it has divided players into three different categories. These categories are:

1. Aggressive gamers are a group with a high desire for exploration and victory. They want power and status in the game.
2. The discovery factor is important for social gamers and their main goal is to increase interaction with other players.
3. Inactive gamers are the toughest group for gamers. With exploration and victory, they're not as motivated as other player groups.

2.5.4. The gamification player type hexad

Gamification can be applied to many independent areas. Player types different as fields vary. The goal group of gamifications is not expected to be people who play games all the time.

Gamification can show individual differences in triggering the motivation factor, which is the key point of gamification, target-oriented work through a gamified system for learners with common characteristics will increase the chance of obtaining more productive results.

When gamified systems are created considering personality traits, behavior and attitude differences, it makes it easier to reach the target (Bush et al., 2015; Sezgin et al., 2020). Applications developed according to user characteristics are used in user interface design (Nov & Arazy, 2013), persuasive technologies (Kaptein et al., 2015) and games (Orji et al., 2013; Bakkes et al., 2012).

In 2015, Andzej Marczewski designed the Gamification Player type Hexad. This model is the first example to define the profiles in the gamification applications (Diamond et al., 2015).

Marczewski (2015) has six different player types. These player types are:

1. Philanthropists
2. Socializers
3. Free spirits
4. Achievers
5. Players
6. Disruptor

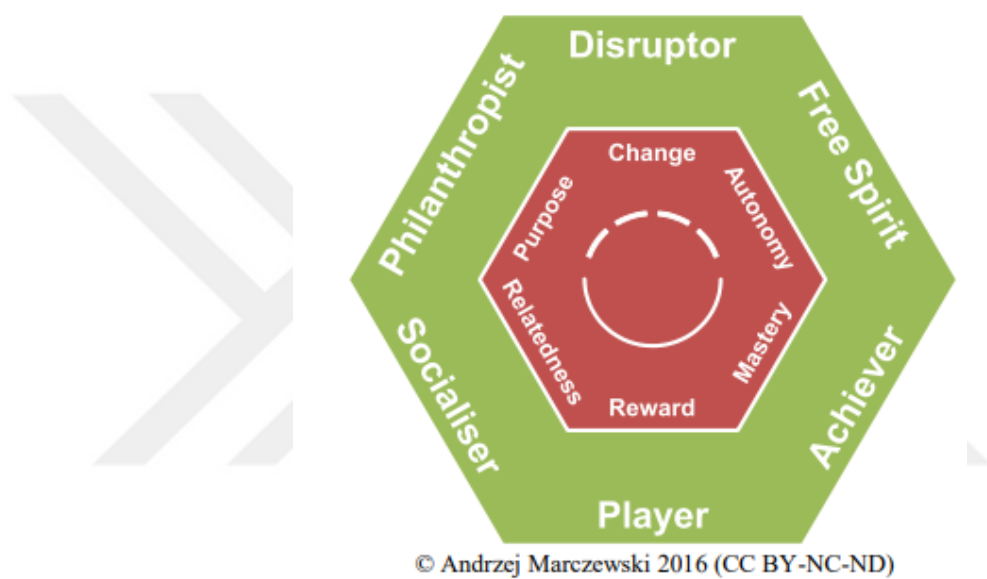


Figure 7. Gamification player type hexad (Marczewski, 2015)

Given the personal differences in intrinsic and extrinsic motivational elements, a figure has been created that describes the relevant player types and motivational elements. Based on this model, Marczewski (2015) explains the player types and motivations as follows:

Table 3. Gamification Player Type Hexad

Player type	Definition	Suggested Game Elements
Philanthropists	Philanthropists are motivated by purpose. They are altruistic and willing to give without expecting reward.	1. Collection and Trading 2. Gifting-Knowledge Sharing 3. Administrative roles
Socializers	Socializers are motivated by relatedness. They want to interact with others and create social connections.	1. Guilds or Teams 2. Social networks 3. Social comparison or pressure 4. Social competition 5. Social discovery
Free spirits	Free Spirits are motivated by autonomy, meaning freedom to express themselves and act without external control. They like to create and explore within a system.	1. Exploratory Tasks Nonlinear Gameplay 2. Easter eggs 3. Unlockable orrare content 4. Creativity tools 5. Customization
Achievers	Achievers are motivated by competence. They seek to progress within a system by completing tasks, or prove themselves by tackling difficult challenges.	1. Challenges 2. Certificate 3. Learning 4. Quests 5. Levels or Progression 6. Boss battles
Disruptors	Disruptors are motivated by the triggering of change. They tend to disrupt the system either directly or through others to force negative or positive changes. They like to test the system's boundaries and try to push further.	1. Innovation platforms 2. Voting mechanisms 3. Development tools 4. Anonymity 5. Anarchic gameplay
Players	Players are motivated by extrinsic rewards. They will do whatever to earn a reward within a system, independently of the type of the activity.	1. Points 2. Rewards or Prizes 3. Leaderboards 4. Badges or Achievements 5. Virtual economy 6. Lotteries or Games of chance

***This table was prepared using the study of Tondello et al. (2016).**

2.6. Gamification in Education

Gamification has become a preferred method in many different fields in order to solve a problem and bring to a more interesting and motivating form. According to the 2014 Horizon Report, in which current developments and technologies for the future of education were published by the New Media Consortium (NMC), which is composed of educational technology experts, it was stated that gamification is among the promising methods in education (Johnson et al., 2014). In addition to the motivation and cooperation of gamification, it creates an opportunity to transform educational outputs into a more efficient form due to its high visual design qualities.

Basic gamification is currently applied in schools, which have made up the majority of educational fields for many years. For example, giving a homework to students, scoring the students according to the results of the homework, categorizing their grades (good, medium...). If we evaluate all these processes in terms of gamification, it can be explained as assigning a task to the player, determining the badge according to the task score, and if successful, the player moves to the next level (Lee & Hammer, 2011). However, due to the fact that a good enough design could not be made considering individual differences and environment variables, the gamification approach in education has not been popular until recently.

In a well-designed gamified education application, learners have the chance to find a role and interact with other learners. In this way, for an audience with a common goal, interaction both shortens the process of reaching the goal and increases its efficiency. For learners, the process sometimes carries compelling elements, but this motivates the learner and creates an environment of struggle and competition. Gamified systems with a dynamic structure make learning effective as they are based on the user's own learning by experience (Kapp, 2012) and positively affect the motivation and participation of the learner while improving their knowledge and skills (Huang & Soman, 2013). All this makes gamification one of the most perfect approaches in education.

Before gamification is applied, the targeted behavior change should be observable and desired behavior (Tunga & İnceoğlu, 2016). The biggest problems related to learning processes in education are the inability to gain a permanent behavior due to the fact

that motivation (Lee & Hammer, 2011) and commitment (Prensky, 2005) cannot be maintained in the long term. Educational environments provide external motivations to learners, but internal motivation is sustainable for the learner. Gamification is also the best method to gain intrinsic motivation (Banfield & Wilkerson, 2014).

Gamification brings the learning process to a motivating structure with its rapid feedback, progression, storytelling and freedom to fail features. When the system is gamified based on these features, the success rate of the system increases. The effects of these features on the process and the learner are given below.

1. Freedom to fail: Gamification allows the learner to design low-risk systems against the possibility of mistakes. The learner is given the freedom to fail. A design that gives control to the learner aims to increase the learner's participation by increasing their courage (Gee, 2008; Kapp, 2012; Lee & Hammer, 2011).
2. Rapid feedback: The gamification design informs the player about the status of the instant and in the process through feedback such as whether you have successfully completed this stage or failed at this stage. The high frequency of effective learning and feedback is linear (Kapp, 2012). Gamification design provides the opportunity for repetitive learning and practice (Gee, 2008), so that the missing parts can be identified and easily eliminated and permanent learning can be achieved.
3. Progression: It covers categorizing the information under the headings of tasks and levels by guiding the learner. Thanks to this method, the learner is aware of when, how to start and how to progress (Benson, 1997). It is a guide for the learner.
4. Storytelling: Storytelling of the learning process in terms of participation and motivation is an effective method for the applicability of the tasks. Instead of a list of tasks for learners, a narrative process affects learning positively (Kapp, 2012).

The purpose of gamification applications in education is to increase motivation and participation by making learning-teaching processes more enjoyable. When the concept of gamification is examined, the fact that motivation is basically included supports that it is the right method for this purpose.

2.6.1. Gamification vs game-based learning

Gamification and Game Based Learning (GBL) are two different methods that are quite confusing in the field of education. Game is used as a learning tool in game-based learning processes. GBL enables the learner to acquire the targeted knowledge and competence while playing games and provides the learner with interactive environments with games (Karataş, 2014; Kirriemuir & McFarlane, 2004). GBL creates a suitable environment without excessive information by giving the learner the opportunity to repeat and make mistakes (Van Eck, 2006). In the gamification method, the learning process is gamified, and the targeted behavior is gained in the process (Burke, 2016).

While the GBL method can be directly integrated into the lesson through the subject it is related to in the educational processes, there is no such restriction for the transfer of gamification to the lesson (Yılmaz, 2015). Since gamification provides the opportunity to create changes in the way the lesson process is taught, variations such as the subject and scope of the lesson do not matter. GBL has the quality of being a part of the lesson, but gamification covers the whole lesson.

In fact, while both methods are applied, game elements are used in the process, but in the GBL method, the learning process is carried out directly through the game, while in the gamification method, the learning process is gamified, and learning is provided in the gamified process.

2.6.2. Gamification in adult education

In-service training is courses, seminars and similar studies organized to increase the productivity of all teachers working under the Ministry of National Education (MEB EARGED, 2006). In-service training conducted by the Ministry of National Education are defined as planned training activities carried out to improve the knowledge, skills, perception and attitude of the personnel from the date they start to serve, and to adapt to the profession and new developments (MEB, 1994). Classical methods are still used to a greater extent in professional development and teacher education.

Unlike classical methods, digital technologies promise great hopes in order to increase the motivation of teachers while making their professional development effective and

efficient without disturbing their daily routines. Although many professional development activities have been moved online with the pandemic, traditional methods still continue to be used in the education process. However, the limitations of traditional teaching practices, the expansion of digital technologies and their widespread use in education have led educators to seek alternatives. Digital games and gamification are among the important methods that have been used recently in minimizing the limitations of traditional teaching practices in areas such as motivation and active participation. In the struggle for permanent learning, the gamification approach is based on motivation and aims to provide the user with a target-oriented permanent behavior in the field where it is applied. Gamification allows for better and deeper learning.

For adults who have a certain level of readiness in terms of their professional qualifications and use of technology, learning in professional development processes turns into an action performed by evaluating it from many different angles. Many situations guide learning processes such as previous experiences, mistakes made, lessons learned from mistakes, what works well and what is not a good choice for them. For this reason, it is necessary to develop professional development training for adult individuals who know themselves and approach their learning processes consciously, according to a standard suitable for everyone as much as possible. In-service training should meet the wishes, thoughts, future dreams and expectations of teachers, and should be more motivating, more entertaining, and have a flexibility that can be changed in the process. At the same time, for adults who have a more realistic perspective compared to other age groups, the qualities and results of the process should be concretely observable.

Adults have made lifelong learning a way of life due to their higher level of awareness. Adults participate voluntarily in learning processes. Therefore, it is important that the learning environments are suitable for the target and meet the learning needs (Gökkaya, 2014). The learner is given the opportunity to have an active experience in the learning processes centered on the goal determined by gamification. The learner is not only in the position of a listener but also in an interactive process in learning processes. In gamified learning processes, the opportunity to create a social environment is provided, and thus the diversity of knowledge in the learning environment increases.

2.7. Prior Researches

It finds solutions to many problems in our daily life because it contains motivation on the basis of gamification. It helps to successfully overcome the biggest problem for education, by integrating the fun factor into sustainable and permanent learning. In this section, literature reviews, experimental and design studies on the concept of gamification, gamification approach in education and the application of gamification in e-learning environments are included. At the same time, the studies give an idea about the approaches of learners from different age groups towards gamification applications.

Meta-analysis studies, one of the literature review methods, are studies in which many studies on the same subject are examined together (Fraenkel & Wallen, 2006; Şahin, 2015). Since it creates a pool with a wide variety of information on the subject, bringing together these studies conducted by more than one researcher helps to have a wider range of information on the subject. In this area, meta-analysis studies based on gamification have been examined. These studies include the concepts of gamification and the application of gamification in education. It is observed that the findings obtained from the studies are parallel. The findings indicate that the application of gamification approach in education has a positive effect on the success, performance, participation and motivation of the learner (Karataş, 2014; Özcan, 2019).

Karataş (2014), within the scope of gamification in education, conducted a literature review in Turkish and English with the keywords gamification and learning in EBSCO, Elsevier, Scopus, ProQuest, National Thesis Center and Google Scholar databases without year limitation. 62 studies thought to be suitable for the research were systematically examined. As a result of these examinations, it has been seen that in most of the studies, undergraduate students are preferred as the target audience, information technologies as the learning area, and the effect of gamified environments on success and performance. At the same time, it was concluded that the badge and score are the most frequently used gamification components, and the motivation theory is mostly focused on.

Özcan (2019), on the other hand, examined the effect of gamification in education on students' academic success, performance, attitude, participation, and motivation in his

master's thesis study. A literature search was conducted in the Google Scholar, ERIC, Science Direct and YÖK Thesis search databases covering the 2008-2018 period, in Turkish and English, with the keywords gamification, gamification in education and effect of gamification. A doctorate thesis, a master's thesis and an article consisting of 41 quantitative studies, which are thought to have data suitable for this study, were selected. 65 data obtained from these studies were categorized as 23 academic achievement, 11 performance, 8 attitude, and 15 motivations. As a result of the study, the effects of gamification applications in education on academic achievement, performance, attitude, and participation were .592, .813, .500, .315, respectively, according to the random effects model; the effect on motivation was determined as .317 according to the fixed effects model. As a result of the analysis, according to the effect size classification of Cohen, Manion and Morrison, the effect on students' academic success and performance is positive and moderate; On the other hand, it was interpreted that the effect on attitude, participation and motivation was positive and at a small level.

Özkan and Samur (2017), a study conducted in line with these meta-analysis studies, examined the effect of the application of gamification method in learning processes on learner motivation in the content analysis study. In the research conducted on the keyword's gamification, motivation and experimental, 9 articles were reached. As a result of the research, it was noticed that the difference between gamification and game-based learning was misunderstood. Among these studies, it was observed that the difference in the effect of gamification on motivation was observable in 7 of these studies and the most frequently used gamification components were points, levels, awards and badges. In line with the studies examined and the literature, it was concluded that gamified instructional design should be done well in order for gamification to affect learner motivation positively.

It was concluded that the majority of the results obtained from the studies in which gamification was applied to various age groups within the scope of different educational contents and its effect on learner motivation and success were examined (Buckley & Doyle, 2016; Fiş Erümit, 2016; Fitz-Walter, et al., 2017; Karabacak, 2018; Kim et al., 2018; Muntean, 2011; Sarı & Altun, 2016; Su & Cheng, 2015; Şahin & et al., 2017; Wu, 2018; Yılmaz & Karaoğlu Yılmaz, 2019). However, there are also few

studies in the literature stating that gamification has no effect on academic achievement and learner motivation (Domínguez et al., 2013; Hanus & Fox, 2015).

In the experimental study conducted by Hanus & Fox (2015), learners were divided into two groups and a gamified environment, and a non-gamified environment were created. For 16 weeks, the learning processes of the learners were examined in line with the intrinsic motivation, sociability in the learning environment and academic success criteria. While creating the gamified environment, leaderboards, badges, and competition, which are the basic gamification elements, were used. A questionnaire was applied to the learners at the beginning, in the process and at the end of the process. As a result of the process, it was concluded that the gamified environment did not have a positive effect on intrinsic motivation and academic achievement. However, an addition has been made to the study that gamification elements are insufficient and if they are increased, the success rate of gamification will increase.

Considering the diversity in learning environments, the gamification requirements of classical, virtual classroom environments and e-learning environments differ. However, although the learning environment varies, it is observed that a well-designed gamification has a positive effect on the motivation and learning efficiency of the participants (Aşıksoy, 2018; Bolat, Şimşek, & Ülker, 2017; De-Marcos et al., 2014; Gündüz, 2020; Huang et al., 2018; Jo et al., 2018; Meşe, 2016; Tsay et al., 2018; Yıldırım, 2016). These studies were revealed by applying the experimental research method. Experimental research allows us to observe more than one dependent variable simultaneously in the process. If applied by paying attention to its basic features, it can be stated that it is the best choice for testing hypotheses about cause-effect relationships (Fraenkel et al., 2018).

This study by De-Marcos et al. (2014) was conducted within the scope of the "Information and Communication Technologies Competence" course conducted remotely with undergraduate students on the application of gamification in e-learning. In this study, Elgg2 social network and Blackboard gamification plugin are compared. Prize and competition game elements are used. When the data obtained from the study are evaluated in terms of learner success, it has been observed that it has a positive effect, but when it is evaluated in terms of sociability and participation, the social network is more successful.

In the doctoral thesis written by Gündüz (2020), the effect of using game components in online learning environments on learners was investigated. Two groups were formed as experimental and control. While the experimental group was trained on the website with gamification components, the control group was away from a gamified environment. According to the data obtained as a result of the study, higher values were obtained in the interaction, participation and success variables of the experimental group participants.

In her doctoral thesis, Meşe (2016) applied gamification and observed the results in order to increase efficiency in blended learning environments. In the study, 63 participants who took the Information Technologies in Education course in 2015-2016 were divided into two groups as experiment and control. While the experimental group was involved in a gamified training process, the control group completed the process with classical management. According to the data obtained from the study, it was stated that the gamified environment was more interesting for the participants, although there was no big difference in terms of academic success, performance and motivation.

In this study by Yıldırım (2016), the application of gamification approach in education is discussed in order to increase the learner's motivation, academic success and attitude towards the lesson. The lesson was given in a gamified form to the students who took the "Teaching Principles and Methods" course. In line with the data obtained after the interviews with the students who took the course, it was concluded that the attitudes of the students towards gamification were positive. When the students evaluated the process, they stated that they had a better and permanent learning experience and that they had the opportunity to create a more social environment.

With the transfer of learning to e-learning environments, the diversity of learner profiles has also increased. With this increase, individual differences have gained more importance in the application of the gamification approach to learning processes. E-learning has been an opportunity for adults in terms of space and time, and studies have been conducted in which gamification has been integrated into different subject scopes (Bozkurt, 2014; Gökkaya, 2014; Mert Yıldırım, 2019; Li et al., 2012).

Bozkurt & Genç Kumtepe (2014) conducted a literature review on the concept of gamification, gamification elements, player types and gamification design, and

Gökkaya (2014) on the role of gamification in professional development processes in adult education. As a result of both studies, it was stated that a correctly designed system provides the opportunity to have motivating, entertaining and attractive experiences for the user.

Mert Yıldırım (2019), on the other hand, investigated teachers' approaches to gamification practices and the effects of using teachers and students in the gamified education process on motivation. More than one data collection tool was used in the study. Questionnaires and interviews were applied to participant students and teachers. When the data obtained were examined, it was seen that although the students' approach towards gamification in education was positive, the intrinsic motivation decreased as the age increased. When evaluated in terms of teachers, it has been determined that there are differences in adapting to the gamified system depending on their technology use proficiency. It has been stated that it has a positive effect on motivation for students and teachers.

In the study conducted by Li, Grossman & Fitzmaurice (2012), a gamified educational environment was presented to adult individuals who will learn AutoCAD. Two separate learning environments were created for the experimental and control groups. The experimental group completed the AutoCAD training processes in GameCAD, which is a gamified environment, and the control group in TutorCADd, which did not apply gamification. It has been stated that the gamified environment used in the study includes more than the basic gamification elements such as commonly used badges and leaderboards. When participation, performance level and entertainment were compared for both groups, it was observed that the experimental group was more effective. Participants found the gamified environment more fun and effective in learning.

According to the report prepared by the World Bank (2018), there are four main reasons why learning cannot take place successfully. These reasons are teachers without skills and motivation, unprepared students, school management and school inputs that cannot affect teaching and learning. It cannot be expected that the qualifications of schools are higher than the qualifications of teachers in learning (Guskey, 2002), it is an undeniable fact that one of the most influential people in learning is a teacher. The fact that teachers do not have the skills and motivation, which is considered as an important factor in the failure of learning, may give a clue about

the fact that professional learning cannot be carried out effectively. The application of gamification, which includes motivation in the professional learning of teachers, can be a solution to this problem. A well-designed gamification application is a source of motivation (Bozkurt & Genç Kumtepe, 2014). In this direction, there are studies in the literature that can guide the application of gamification in education by considering individual differences (Ar & Akgün, 2014; Çağlar, & Arkün Kocadere, 2015; Fiş Erümit, 2016; Şen, 2019). These studies can be supportive in order to make suggestions for the effects of gamification elements used in e-learning environments and gamification designs, and to offer more qualified learning outcomes and learning experiences to researchers.

In the study conducted by Ar & Akgün (2014), a scale that is thought to guide educational gamification practices was developed. It is a Likert-type scale consisting of 17 items. Scale only supports developing the visual interface of the application. The scale determines the application's suitability and level of gamification fundamentals but does not indicate a situation about the application's success in learning. In other words, the relationship between the scale results and the effect of the gamification experience on the user cannot be interpreted linearly.

In the study of Çağlar, & Argün Kocadere (2015), research on the positive and negative results of the application of gamification in educational environments, gamification designs and steps, and gamified tools applicable to learning environments were examined. Gamification tools that can be integrated into learning environments are Classroom Dojo and Zondle, which are specific tools for gamification, TalentLMS, which directly uses gamification, Moodle and Blackboard, which are learning management systems that use plug-ins, and Credly, Openbadges.Me, 3D Badge Maker, Passport and Imagefu, which are digital badge development tools. exemplified.

In this study by Fiş Erümit (2016), a research based on gamification of a course process was carried out in order to create a design framework for gamification. This design-based study consists of three stages. A gamification design was made for a graduate course in the first and second stages, and for an undergraduate course in the third stage. By evaluating these designs, a framework for gamification in education has been proposed. According to the data obtained from the survey and interview results made during the design process, it was concluded that gamified environments are motivating

for the learner. At the same time, it has been observed that demographic characteristics make a difference in gamification preferences.

Şen (2019) focused on the usability of user interface design and the role and contribution of gamification in the experience gained in order to improve user experiences. In this direction, the concept of gamification and the relationship between design models and motivation and the qualities required for a good gamified design are examined. As a result of this study, a gamified mobile application interface called “Quistudy” was developed within the scope of the determined qualifications. A study was conducted to guide the effective use of gamification elements for mobile interface designs to be developed for use in education.

According to the OECD (2019) data, in the evaluation surveys applied to the professional development training that teachers have attended around the world, they evaluate it positively according to the criteria of participation in professional learning and its reflection on educational processes. However, it is observed that problems related to professional learning continue. Transforming professional development training into a more effective and appropriate form will contribute to overcoming these problems. It is thought that the study titled "Developing a professional learning model for teachers and applying the model to gamification in education" by Alagöz Hamzaj (2022), who raises awareness about determining the needs of teachers in their professional development processes and gamification in education, is thought to be useful.

A professional learning model was developed within the scope of Alagöz Hamzaj's (2022) doctoral thesis, which aims to transform the professional development processes of teachers into a more effective form. In the study, firstly, the requirements in professional learning were determined and these requirements were revealed by literature research. After this stage, the professional learning model was developed and implemented. During the research process, semi-structured interviews were conducted with teachers and teacher educators. In line with the data obtained, it has been seen that teachers' perspectives on professional learning are different and therefore each teacher's readiness level, preferences and motivation type are unique. These evaluations and the desire to create a sustainable structure formed the basis of the model. Within the scope of the model, gamification, which is thought to appeal to teachers and students, has been chosen as an educational topic. It has been stated that

the subject is of interest to many people. It is thought that the model will guide professional learning, in-service training and seminar processes. As a result of the interviews made with the participants after the completion of the training process, it was learned that the teachers carried the gamification to their classrooms.

With the related research, gamification draws a general framework about the variables related to gamification, the way it is applied in education, the effects of its application in education on students and teachers, teachers' professional learning needs and learner expectations. Considering the results, a design proposal will be made for teachers to gain a more motivating and more effective form with gamification, a new approach in education.



3. METHODOLOGY

This section presents information about the research method, study group, data collection tools, implementation of the research, data analysis, validity and reliability of the research respectively.

3.1. Research Method

Planning research is governed by the notion of ‘fitness for purpose’, and this purpose determines the methodology of a research (Cohen et al., 2007). This study used a sequential mixed design (Creswell & Plano Clark, 2018) with a small quantitative component embedded in a predominantly qualitative model (QUAL-quant) (Figure 8).

Mixed methods research is basically described as the use of both quantitative and qualitative methods in a single study (Creswell & Plano Clark, 2018; Frankel et al., 2012; Johnson & Onwuegbuzie, 2004) to obtain more descriptive data about the research problem and reduce limitations of both methods (Johnson & Onwuegbuzie, 2004; Morse, 2016). It can also contribute to confirming the relationships between variables and ensuring cross-validation. (Frankel et al., 2012). Yet, mixed methods research is more than mere use of both quantitative and qualitative methods in a single study; and what defines a mixed-method design in research is the interaction between those approaches and the resulting integration of the findings from the many components (Morse & Cheek, 2015).

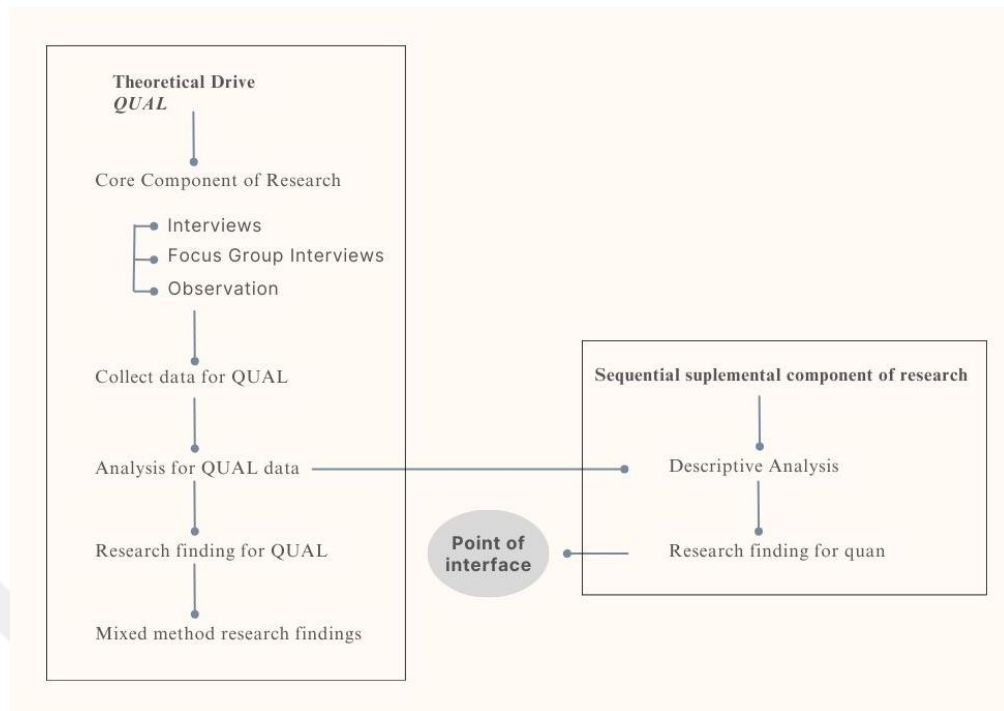


Figure 8. Research design

There are several pattern classifications and design typologies in mixed methods research (Greene & Caracelli, 1997; Morse, 1991; Teddlie & Tashakkori, 2009; Leech & Onwuegbuzie, 2009), this variety and flexibility of mixed methods research have been emphasized and even the mixed methods researchers are encouraged to ‘manipulate’ these designs in a creative manner in specific research (e.g. Teddlie & Tashakkori, 2009).

It is aimed to support the findings obtained based on qualitative data by associating them with the results of the survey study. The findings obtained through interviews and researcher observation guided the development of the gamified in-service training module. The questionnaire results were used to identify teachers’ player types. There are various types of motivation that define the types of players. Based on these motivation types, it is aimed to determine more effective gamification elements for the proposed module by evaluating whether the results obtained in the interviews support such motivations.

3.2. Research Context

This research was carried out within the scope of a TUBITAK 1001 project titled Design and Evaluation of the Effectiveness of Scientific Research-Supported Online Mentoring (e-scaffolding) in In-Service Teacher Education (BISDEM) (Project No. 220K080). BISDEM project aimed to examine the effectiveness of the teacher training model integrated with the e-mentoring process of classroom practices to be carried out within the scope of scientific inquiry. The main purpose of the project was to examine and evaluate a blended in-service training model for classroom and science teachers to allow them to investigate and improve the effectiveness of their classroom practices within the framework of scientific inquiry. The participants of the project were 30 classroom and science teachers working in public middle and high schools. The project included mentoring, coaching, peer learning and collaboration strategies in which teachers' ideas and expectations are prioritized. In this context, it involved a continuous support program such as discussion meetings, participating in different teachers' lessons as observers, lesson planning and evaluation. It was designed as a mutual dialogue platform shaped according to the expectations and needs of each teacher in their own classroom environment. The system consisted of four stages (Table 4):

1. Identifying teachers' existing knowledge, experiences and views on scientific inquiry and science teaching,
2. Teachers' practicing and videotaping a scientific activity in the classroom, followed by mutual evaluation of expert opinions,
3. Start of the testing process where teachers constantly renew themselves, and peer assessment,
4. Teachers' transfer of knowledge and experience where peers continuously support and evaluate each other guided by mentors.

Table 4. BISDEM Project's stages

Stage 1	Stage 2	Stage 3	Stage 4
Before the Application	Before the Application	Before the Application	Before the Application
Lesson Materials	Submit Video	Submit Video	Lesson Materials
Submit Video	Self-Assessment	Self-Assessment	Submit Video
Self-Assessment	Feedback Stage	Peer Review	Self-Assessment
Feedback Stage		Feedback Stage	Peer Review
			Feedback Stage

The implementation period of each stage was planned as one week:

1. Before the Application: Teachers upload the photos and videos they have taken in the classroom.
2. Lesson Materials: Teachers upload the activity plan to be implemented during the lesson.
3. Submit Video: Teachers upload a lesson video from the classroom environment.
4. Self-Assessment: Teachers evaluate their lesson videos using the form.
5. Peer Review: Teachers evaluate other teachers' videos using the peer review documents assigned to them by the mentors during the feedback phase.
6. Feedback: Mentors publish a feedback document the observation form created to evaluate teacher videos during the project, uploaded by the teacher during the "Submit Video" stage.

Based on the planned project activities, two digital platforms were needed: an interactive platform where participating teachers and mentors would be in contact and project activities would be implemented; and a communication platform between the project management and participants. The interactive platform was supposed to allow for creating, logging in and using work sessions where mentors and teachers registered and authorized to use the platform, for implementing and monitoring the project activities under aforementioned four stages such as sharing according to controlled and determined date intervals and following up simultaneously, and for storage of the content shared by mentors and participating teachers during the project process.

Accordingly, the project management decided to use a 3rd party software meeting the basic requirements, and Google Classroom was chosen as the interactive platform for the BISDEM project since it was developed by Google as a learning platform especially for schools, which aims to simplify the creation, delivery and grading of assignments. Yet, during the process, Google Classroom's low interaction between teachers and mentors was the starting point of this research to design a gamified module with fundamental gamification elements for motivation and interaction among users for similar digital in-service training platforms.

Besides mentors and teachers, the project also had a technical support team, of which the researcher was a part. The role of the researcher in this project was to ensure the communication between the participating teachers and mentors during the project process, to assist the interaction processes of the participating teachers with the platform, and to plan their social media accounts and website shares during the project process. From an engineering background, the researcher had the opportunity to work with teacher educators and teachers within the BISDEM project for 24 months.

3.3 Study Group

This research has three different study groups. Two main study groups were determined based on their unique experience of participating in the same project and experiencing the same process at the same time; hence all study groups were selected through a purposeful sampling method. Purposeful sampling is a method used to classify units of analysis with common characteristics (Fraenkel & Wallen, 2006; Mills & Gay, 2019). This method is preferred if a specific, unique feature or quality is sought in the research (Neuman, 2013). In purposeful sampling, units of analysis are selected "not randomly, but for a specific purpose" (Tashakkori & Teddlie, 2003). Purposive sampling focuses on the "depth" of information that can be obtained from individual cases (Teddlie & Tashakkori, 2015). The disadvantage of this sampling method is that as a result of the sample selection due to the researcher's bias, the selection may not represent the sample well enough and the generalizability of the results may be limited (Bryman, 2012; Creswell & Creswell, 2018).

3.3.1 Teachers

This group consists of participant teachers of the BISDEM project, who were selected based on criteria such as their experience, their willingness to participate in the project, the priorities and needs of teachers and schools, and their interest and motivation for the research. The participants consisted of 26 female and four male teachers from schools in different districts of Muğla province. There were 15 science teachers and 15 classroom teachers in the project.

The first study group of this research consisted of 20 teachers selected based on voluntariness among the project participants. As seen in the demographic data of the study group (Table 5), ages range of the teachers was between 25-60, four were male and 16 female. Three teachers completed and two were in the process of their graduate training. There was an almost equal distribution of teachers based on area of study with 11 teachers from science teaching and nine from classroom teaching. There were no beginner or senior teachers among the participants.

Demographics of the study group are used to understand the diversity within the group and to analyze the distribution of individuals with specific characteristics.

Table 5. Demographic Information of Participating Teachers

Features	n
Age	25-30
	31-35
	36-40
	41-45
	46-50
	51-60
Gender	Male
	Female
Education Status	Undergraduate
	Master's Degree (Continuing)
	Graduate Degree (Masters')
Area of Study	Science
	Classroom Teaching
Professional Experiences	0-5 years
	6-10 years
	11-15 years
	16-20 years
	21-25 years
	25+ years

3.3.2 Mentors

The second study group of the research included six mentors, who took part in the BISDEM project. These mentors were between the ages of 30-45. There were three male and three female mentors in the group. The mentors were also specialized in the fields of science and classroom teaching. In terms of academic positions, two mentors

were associate professors, three had doctoral degree, and one mentor was an instructor. Selection of the mentors was based on their compatibility, areas of expertise, and classroom experience (Table 6).

Table 6. Demographic Information of Participating Mentors

Features		n
Age	30-35	3
	36-40	2
	41-45	1
Gender	Male	3
	Female	3
Title	Instructor	1
	PhD	3
	Assoc. Prof.	2
Professional Experience	0-5 years	1
	5-10 years	2
	11-15 years	2
	15-20 years	1

3.3.3. Subject matter experts

The third working group of the research consists of three professionals who are experts in gamification. These experts are academicians with scientific research and publications in the fields of digital game design, gamification and game-based learning, and although they are not direct stakeholders of the project, the ideas and suggestions from these experts were useful in laying the theoretical foundation for the module to be proposed within the scope of the research (Table 7).

Table 7. Demographic Information of Experts

Expert Code	Title	Workspace
U1	Associate Professor .	Use of technology in education and teaching, Use of digital educational games, Gamification in education, Educational game design, Digital game design, Children's use of technology, Game addiction, Game-based learning
U2	Professor	Pre- and In-service teacher training, Web-Based Training, Adult Learning, Human Performance Technologies (EPSS), Instructional Technology Planning, Reusable Learning Objects.
U3	Associate Professor	Digital Game Design, Computer Engineering, Swarm Intelligence and Applications, Simulation and Large-Scale Simulation Projects, Software Engineering and Test Automation

3.4. Data Collection Process and Instrument

In order to give direction to the gamified module to be modeled within the scope of the research, different data collection tools were used, and the data collection process was diversified with focus group interviews, questionnaire application and observation in addition to the basic data collection tool of individual interviews.

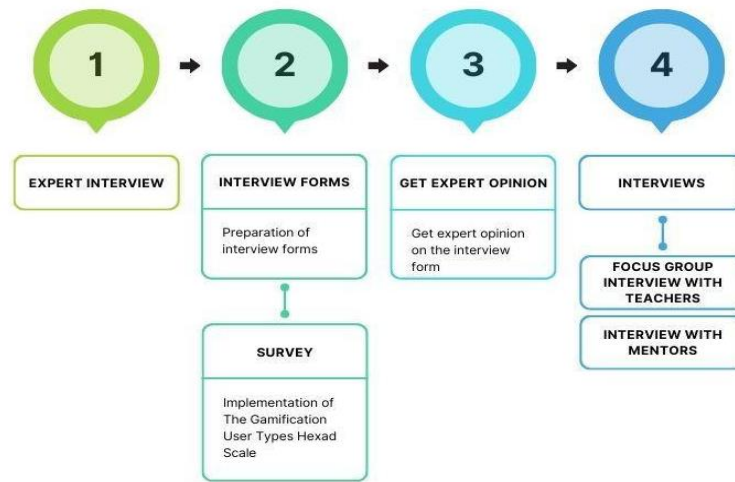


Figure 9. Data collection process

The data collection process was carried out as shown in Figure 9. First, the interview forms for the interviews with mentors and teachers were prepared based on the findings obtained from the interviews with field experts and the literature; in the next stage, the forms were finalized by taking expert opinions on the interview forms; and in the last stage, interviews were conducted with teachers and mentors and a player type questionnaire was applied to teachers (Table 8).

Table 8. Data Collection Tools .

Data Collection Tools	
Teacher Focus Interview Form	The focus group interview questions for the teachers were designed to identify the motivation factors and types of users, taking into account the previous project process, platform, mentor, peer and platform interaction criteria.
Mentor Interview Form	Interview questions for mentors were designed to identify the motivational factors and player types of mentors, taking into account the previous project process, platform, teacher and platform interaction criteria.
Expert Interview Form	The interview questions for the experts aimed to get their opinions and suggestions on gamification in adult education and gamification in teacher education.
Survey	In order to increase the scalability and responsiveness of the gamified education module to be developed on the basis of focus group interviews with teachers and interviews with mentors, the player types of scale developed by Tondello according to the Marczewski model and adapted into Turkish by Taşkın and Çakmak was applied to teachers and mentors. (Taşkın & Çakmak, 2020).

4.3.1. Interviews

Interviewing is a method of collecting data in a reciprocal and interactive way with selected individuals (Mills & Gay, 2019; Stewart & Cash, 1985, p.7). This method allows researchers to plan the progress, get answers to the desired questions, and learn from the experiences of experts (Patton, 1987). The interview form can be used to obtain the same type of information from different people on similar topics (Patton, 1987), and thus, researchers can ask the questions they want without too many limitations and learn from the sharing of experts based on their own experiences.

Interview is an important data collection method for qualitative research. It also provides access to important information that cannot be obtained through observation (Mills & Gay, 2019).

In this study, semi-structured interviews were conducted with the participants. Individual interviews were conducted with participants in the study group and mentors, while focus group interviews were conducted with the teachers.

Focus group interview is a research method that aims to exchange ideas and develop solutions by discussing a specific problem or issue with a group of people with common characteristics. This method has the advantages of solving problems faster and developing more creative solutions through group processes (Powell et al., 1996; Morgan, 1996; Patton, 2014; Gürbüz & Şahin, 2018).

In this study, focus group interviews were conducted in two groups with 20 teachers participating in the project and individual interviews were conducted with six mentors and three professionals from the field of gamification. All interviews were conducted online as it was easier for the participants and the group facilitator to come together in terms of time and planning. In this way, a process that is independent of the place, where time traceability and recording of the interview is easier for the administrator was realized. In this way, there was no loss of audio and video.

3.4.1.1. Expert Interview Form

The expert interview form was prepared to understand expert opinions on the role of games and gamification in adult education, to evaluate their impact on educational processes, to understand the starting points and necessity of gamification, to get

suggestions for gamifying in-service teacher trainings on digital platforms, to determine the elements to be used in a gamification module, to understand common mistakes and to shed light on suggestions for software development.

The expert interview form was designed to provide an in-depth and qualified evaluation of gamification practices in the field of adult education and teacher education. The expert opinions obtained in this way can be used as an important source of guidance for educators and designers.

The interview questions were reviewed by three faculty members in educational technologies, learning sciences, gamification, and digital education, and finalized with the necessary arrangements based on the recommendations of the experts. The final form consisted of seven open-ended questions to provide a comprehensive analysis on the subject.

3.4.1.2. Mentor Interview Form

The mentors' interview form was developed to contribute to the modeling of the gamification module planned within the scope of the research by taking the opinions of the mentors of the BISDEM project on digital platforms, learning motivation, interactive learning environments and gamification in line with their project experiences.

The questions will guide the mentors to identify their role, consider their past experiences and share their perspectives on the project process in the light of both their general online education experiences and their experiences in the specific processes of the project from the perspective of the instructor user.

The interview questions focused on key themes such as evaluation of online professional development programs, motivational factors, interactive learning environments, gamification, and traditional learning methods. The guiding sub-questions under each of these themes were intended to ensure that the mentors' responses were more detailed and comprehensive.

The interview questions were prepared in the light of the findings obtained from the expert interviews and submitted to review of three faculty members. The form was finalized with the necessary arrangements based on the opinions of the experts and

applied in semi-structured interviews with six mentors working for the BISDEM project. The form consisted of four open-ended questions.

3.4.1.3. Teacher Interview Form

The teacher interview form aimed to contribute to the modeling of a gamification module that can be integrated into digital platforms to be used for teacher training purposes by taking the views of teachers on digital platforms, learning motivation, interactive learning environments and gamification in line with their experiences within the BISDEM project.

The interview questions were prepared in line with the findings obtained from the expert interviews, submitted to the evaluation of three faculty members, and finalized based on the opinions of the experts.

The interview form consisted of 17 open-ended questions so as to reflect the thoughts and experiences of teachers.

The interview form was applied to the study group consisting of 20 classroom and science teachers in two focus group interviews.

The questions in the interview form intended to address the participants' experiences in the online learning process in detail, starting from the usability of the digital platform where the training took place. In this context, the information obtained through usability, interactive elements, interaction with mentor teachers, motivational factors and gamification elements were expected to provide important guidance on strategies for improving online teacher trainings and increasing teacher participation motivation. It is expected to contribute to the gamification module design planned to be modeled within the scope of the research through the participants' preferred learning environments, motivation factors, sensitivity to gamification elements and guidance expectations in online education.

3.4.2. Observation

Observation is a research method in which the researcher directly examines events occurring in natural environments. This method allows events to be observed and

recorded in real time (Büyüköztürk et al., 2018). There are various types of observation, and these types vary depending on the goal and purpose of the researcher.

Unstructured observation is the process of entering a situation without a specific goal and watching the natural flow of events. This method is used to understand the natural development of events (Cohen et al., 2007; Fraenkel & Wallen, 2005). In observation processes, the role of the observer varies depending on the research. In participant observation, the researcher takes part in the observed situation.

Observation usually occurs when the researcher directly enters the situation or watches events. Data is usually recorded in the form of notes, audio recordings or video recordings. Advantages of observation include real-time data collection, better understanding of participant behavior, and awareness. Disadvantages include factors such as small sample size, time and cost, and researcher bias (Cohen et al., 2007).

Observation aims to reveal whether the answers received from individuals during the interviews are compatible with their behavior during the project process. This research adopted an approach in which the researcher assumed the role of participant observer and was actively involved in the process. During the project process, technical support was provided by the researcher for in-service training of teachers and mentors on the digital platform throughout the academic year. Long-term observation on the participants was carried out for six-month periods. The purpose of the observation and the identity of the observer are known to the participants. The observer interacts with the group throughout the process. Observation has a broadly focused perspective, which aims to provide a holistic view of the observed features and to include all their elements.

Observation data were obtained from observation notes made during the project process in which the researcher took part in the role of participant observer, video recordings during the project process and teacher mobilities on the project's digital platforms.

3.4.3. Survey

The third tool for data collection is player types scale that aims to reveal the gaming types of the teachers and mentors in the study group. This section is to provide important input during the integration of the findings obtained from the qualitative

phase of the research into the gamification module planned to be designed within the scope of the research in accordance with Werbach and Hunter's (2012) D6 model. It is planned that the data obtained with this data collection tool would form input to the "describe your players" stage of Werbach and Hunter's model.

We used Modified Gamification Player Types Scale developed by Tondello et al. (2019) based on Marczewski's player types of framework and adapted into Turkish by Taşkın and Çakmak (2020).

The Modified Gamification Player Types Scale was reported to give good results in all adult age groups, and consisted of 24 items under six factors. There are four items under each factor. These factors aimed to identify situations in which users are motivated in the context of gamification. The Scale is a seven-point Likert-type scale, with levels ranging from "strongly disagree" (1) to "strongly agree" (7). Additionally, respondents do not need to be a gamer, be aware of their game preferences, or know the terms of game design because the items consist of general expressions, not specific terms.

The reliability study of the Turkish version of the scale adapted by Taşkın and Kılıç Çakmak (2020) was conducted on 330 university students, where the Cronbach's alpha values ranged between 0.615 and 0.759 (Taskın & Kılıç Çakmak, 2020). Structural validity analysis for the scale model indicated that the fit indices were acceptable. The corrected item-total correlations values range from 0.343 to 0.626, and all items are above 0.30. This demonstrated the scale's ability to distinguish individuals well. Fit indices supported the structural validity of the scale (Taşkın & Kılıç Çakmak, 2020).

For the purposes of this study, the scale was applied online to 20 teachers and 6 mentors.

3.5. Validity and Reliability

In qualitative research, validity examines the accuracy of research results, whether the researcher observes the subject as it is and as objectively as possible, and reliability examines whether the obtained data can consistently measure everything they measure (Kirk & Miller, 1986; Mills & Gay, 2019). In order to ensure validity and reliability in

qualitative research, there are criteria for accurately representing the truth through research results, applying the results, ensuring consistency, being objective and impartial. While conducting qualitative research, certain methods are used to meet these criteria including:

1. Long-term interaction, depth-oriented data collection, diversification, expert review, participant confirmation can be used to ensure credibility.
2. Detailed description and purposive sampling can be preferred in order to provide the transferability criterion.
3. Consistency review can be applied to ensure consistency and confirmation review to ensure objectivity (Erlandson, Harris, Skipper, & Allen, 1993).

In this research, the researcher had the opportunity to work with the participating teachers and mentors in the study group for technical support in the project. This set of processes provided the opportunity to observe the interaction between groups, the interaction of groups with the platform. Long-term interaction with the study group will help determine whether the collected data is instant and periodic.

More than one data collection method was used to ensure data validation. Observation, individual interviews, focus group discussions and questionnaires are data collection tools. In this way, the diversity criterion was met. Expert review was applied to examine the research in various dimensions. In the focus group interviews with teachers and mentors, the appropriateness of the questions was discussed with experts with professional experience in gamification before the forms were applied. In line with the data obtained after the application of the forms, the researcher's approach and plan were shared with the experts and suggestions were received for the module to be developed.

3.6. Data Analysis

3.6.1. Qualitative Data

Content analysis was used in the analysis process. Content analysis is to reveal the messages in the basic context of the data obtained. The purpose of this method is to

establish a relationship with the concepts that can best explain the data obtained as a result of the application (Cohen et al., 2007).

The data were divided into small headings according to the game components, mechanics and dynamics on which gamification is based and categorized according to the relevant D6 gamification step. The answers received as a result of the interview questions prepared considering the gamification process were first coded, themes were found, codes and themes were arranged, and these findings were defined and interpreted (Yıldırım & Şimşek, 2006). The visual explaining this process is presented in Figure 10.

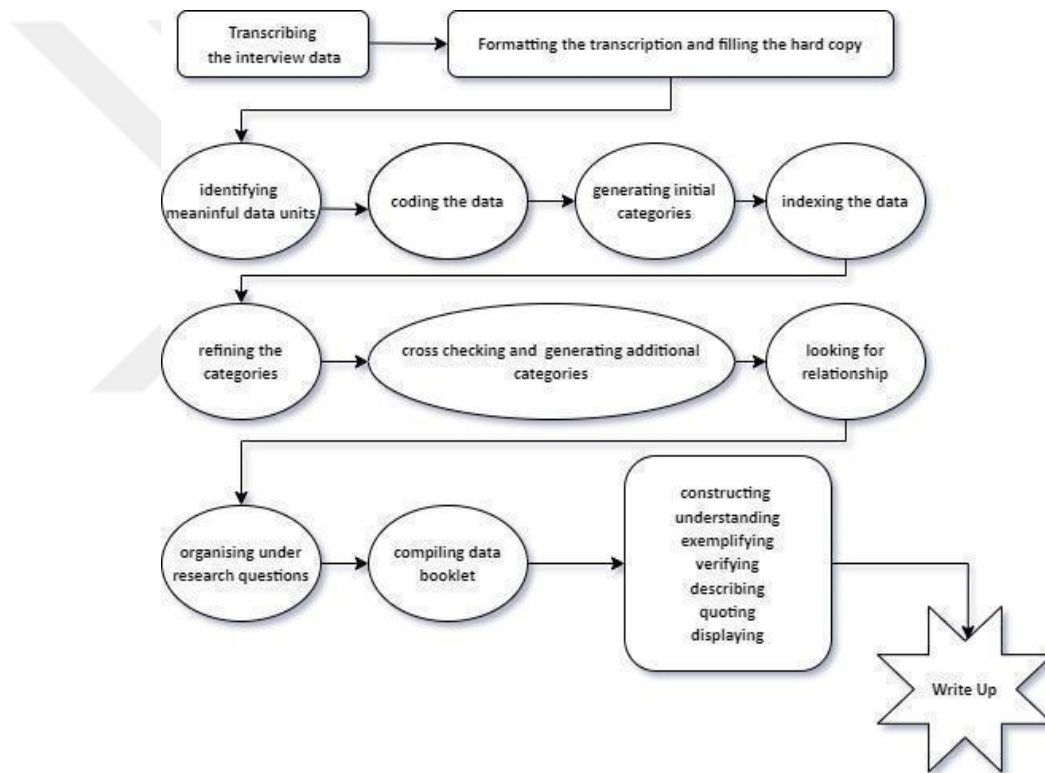


Figure 10. Stages followed in analysis of interview data in a study on the evaluation of teacher performance (Collins,1999)

In addition to participants were coded to ensure anonymity of research participants. The findings are included with these codes throughout the thesis. Participating experts U1, U2, U3; mentors M1, M2, M3, M4, M5, M6 and M7; teacher groups are coded as G1, G2. Themes and codes are visualized in a cross-case table with all participants (Appendix I, Sample Screenshot: Meta-Matrix Used for Cross-Case Analysis).

3.6.2. Quantitative Data

The quantitative dimension of the research consists of data obtained through survey. Data were analyzed using the Python programming language on Kaggle, a widely used platform for web-based data science. Descriptive method was used to support the qualitative dimension of the research. Descriptive method is used to understand and summarize the characteristics of the data set. It has an important role in depicting the data set in a descriptive way (Cohen et al., 2007).

In this research, in order to support the data of the qualitative dimension, the scoring frequencies and category averages of the data according to player types were examined. These results were visualized with graphics using libraries such as Seaborn, Mathplotlib, Pandas.

4. FINDINGS

4.1. Cross-Case and Within-Case Analysis of Participants Interviews

This section includes the findings obtained from the experience of participating teachers and mentors during a digital in-service training program conducted via Google Classroom for a year within the BISDEM project to guide modeling of a gamification module for online professional development. These evaluations are supported by the opinions and suggestions of experts in the fields of gamification and instructional technology.

Before the meetings, detailed planning was carried out. This plan included research questions based on the conceptual framework. In the first stage, the researcher focused on themes identified from relevant information. Each theme was labeled with meaningful labels or codes by the researcher. These initial themes and codes were transformed into subcodes to obtain greater detail. These codes were then classified into specific categories.

The researcher identified 13 categories and 82 codes in total (Figure 11). Based on these categories and codes, 3 withincase and 1 crosscase tables were created. This process reflects an original and detailed planning approach. A basic framework was created for a more in-depth understanding of the patterns, providing a comprehensive analysis opportunity in the following steps.

These themes are: "Attributes, Context, Supportive Learning Environment, Communication, Interaction and Cooperation, Motivation, Game Types, Game-Based Learning, Gamification Elements, Gamification Dynamics, Gamification Mechanics, Design, Usefulness, Technical Infrastructure".

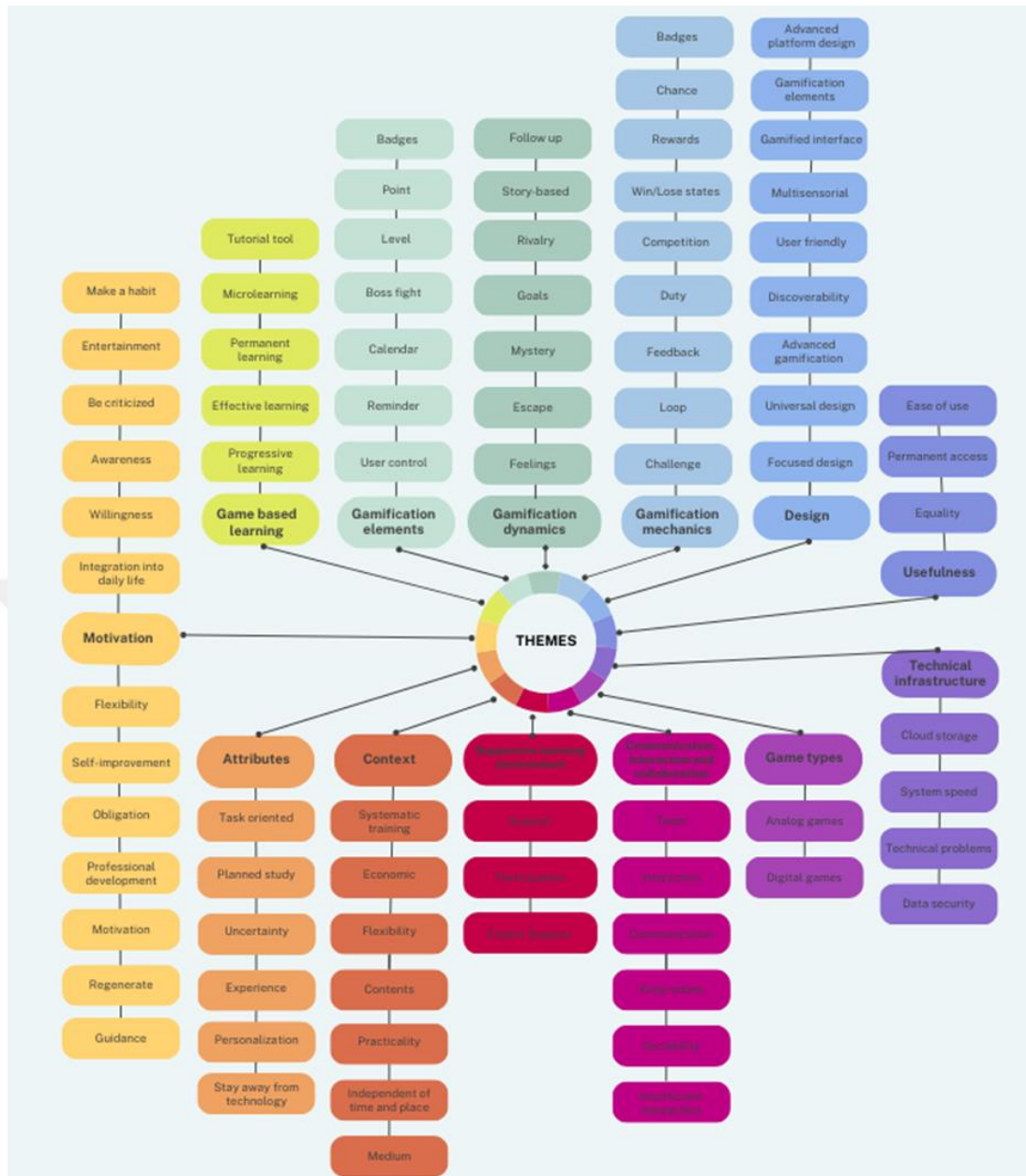


Figure 11. Themes and Codes

This section will present the findings under each theme accordingly.

4.1.1. Theme 1: Attributes

Attributes theme addresses teachers' needs and demands for digital learning processes in detail. This theme refers to specific characteristics in order to determine the behaviors and attitudes teachers display when using the online in-service training

program. This part also includes opinions about teachers' and mentors' individual study preferences and their experiences on Google Classroom.

Table 9. Theme 1: Attributes

Theme	Codes	Participants	n
Attributes	Task oriented	G1, G2, M3	3
	Planned study	G1, M2, M3, M4, M6	5
	Uncertainty	G1, G2, M3	3
	Experience	G1	1
	Readiness	U2	1
	Personalization	G2, M4	2
	Stay away from technology	M4	1

Among the points emphasized in this theme, it is stated that a standard flow and the principle of certainty have a variable effect on teachers. This variability stands out as a motivating factor for teachers. Additionally, emphasizing the comfort of knowing a particular standard or clarity in advance can impact teacher motivation and experience. It has been stated that having a previously known structure contributes to the teacher feeling more confident and in control. At the same time, it is emphasized that individual differences and variable conditions in the learning environment will lead to the learning process being shaped differently, and the importance of teaching designs to adapt to these variations is revealed.

Participant groups coded G1, G2 and participants coded M2, M3, among the study group participants, expressed information including their answers regarding their styles of using Google Classroom and their working methodologies in the in-service training during the project process. These participants generally stated that they were task-oriented individuals and talked about the effect of planned work on motivating them. These opinions are collected under the codes "Task oriented" and "Planned Study".

Teachers and mentors tend to be task-oriented and work systematically and planned.

"...we were just completing the tasks and it came back as completed." (G1)

"When we opened it, there were already features and categories such as the to-do list and the upcoming calendar. This made our job easier. Everyone can see the work or projects on this platform in line with the message they receive. Everyone can decide for themselves how to plan." (G1)

"I logged into the platform only to complete tasks. What's new or is there anything new? The platform was not very motivating because I did not enter with such a feeling." (G2)

"Having a clear plan affects me personally positively, so I can work regularly." (M2)

"My main source of motivation is that I am a man of duty. "If I am working with a group, I first do my duties in the group and then return to my own work." (M3)

Teachers' and mentors' opinions about their ability to cope with uncertain situations they encounter are collected under the "Uncertainty" code. Participants generally prefer smaller surprises over large-scale uncertainties. These little surprises increase their motivation in the learning process.

"It is much better to give all the details in advance." (G1)

"I think it's nice to have surprises from time to time. I think this triggers a sense of curiosity, which in turn enables learning and development." (G2)

"When unknowns and new things come along, we stay more vigorous, and as long as we are truly curious, the process is more enjoyable." (G2)

"Everything is so specific that it is clear what will be done and when. I don't like uncertainties and surprises either." (M3)

The "Experience" code reflects teachers' ability to benefit from their past experiences in the process of using the program. They stated their opinions on the effects of whether or not they have previous experience on the process of adapting to a new situation. Based on these opinions of teachers and mentors, teachers who have no previous experience in the use of Web technologies can also use shortcuts. They seem to adapt over time.

"I have never used Google Classroom before. "I started using it for the first time within the scope of this project, but the application was very easy and effective." (G1)

In addition, the code "Readiness" refers to teachers' readiness to participate in a digital in-service training program and learn new technologies. This indicates teachers' openness to adopting technology and may identify the need to provide them with support.

An expert also emphasized the importance of readiness for the learning process to be effective.

"Spiritual readiness and feeling good are very important in learning." (U2)

The "Personalization" code refers to customization in accordance with individual needs, preferences or characteristics. It is very important to provide content and experience that is adaptable to the teacher's learning style or needs.

During the interviews, a mentor emphasized the importance of customization and making your own work plan.

"It is also very important to be able to make some customizations and create your own plan and for the platform to create space for this." (M4)

4.1.2. Theme 2: Context

This theme refers to the general context and framework of an educational program. In this theme, the emphasis is on convenience and flexibility. Elements such as the teacher's ability to work at his own pace, control and convenience in the online format he needs, online or face-to-face, equality and taking individual differences into account come to the fore. This highlights the importance of an educational environment that encompasses a variety of contexts that include environmental differences and differentiated instructional expectations.

Table 10. Theme 2: Context

Theme	Codes	Participants	n
Context	Systematic training	G1, M6	2
	Economy	G2	1
	Flexibility	G2	1
	Contents	G1, M1, M3, M4, M5, U2	6
	Practicality	U3	1

Independent of time and place	G1, G2	2
Medium	G1, G2	2

This theme expresses the combination of these elements that form the general framework of the educational program, providing a basic guide for the effective design and implementation of learning experiences.

“Systematic training” represents the tendency to work out based on a specific plan and timeline. This approach was said to makes it easier for them and helped them do things in a more systematic way, and they had a positive perspective on this structured and planned approach (M6).

"It is important for me to have a plan and set deadlines, and this approach makes it easier for me to make a schedule. I like it because it allows me to do things more systematically. These elements are not a source of tension for me but are factors that enable me to work more systematically. " (M6)

Teachers' opinions about transferring education to digital platforms, the ability of learning to take place regardless of time and place, and its economy in terms of time and cost compared to traditional teaching methods were expressed and coded as “independent of time and place”, “medium”, and “economy”.

In this context, teachers stated that digital learning environments provided ease of use for them by eliminating the necessity of being in the same physical place and offered them the opportunity to use these environments in a cost-effective manner with their affordability.

"With so much work, it hasn't been possible to get together until now and ... we were in different places. The independence of time and place was, I think, a pretty nice advantage." (G1)

"...it made it easier to carry out the project without being in a fixed environment." (G2)

"I also think that it has some conveniences such as saving time and being economical." (G2)

Considering that teachers have responsibilities in more than one area in their individual lives, it is stated that the flexibility in the duties and responsibilities expected in the training offered on digital platforms pleases the teachers.

In G2 focus group interview, a teacher mentioned that providing “flexibility” in the process had a positive effect on the success of process management.

"Excuses could arise from time to time regarding the timetable. I think the fact that they gave us flexibility when we stated it helped us manage this issue better." (G2)

Opinions about the training “content” showed a similar perspective from teachers and mentors alike, emphasizing presenting the content clearly and concisely.

“... there should not be too many unnecessary details and it should be clear.” (G1)

“There shouldn't be too many options and what to do should be pretty clear and simple.” (M1)

An expert additionally stated that in order for the content to be transferred permanently in adult education, it should be created in a way that suits the lives of adults.

“The most important element in adult education is matching it with life. This is the difference in adult and child learning. Prior information matching is an effective method in adults. In adults, what you call foreknowledge is emotions. He makes a situation he experiences more meaningful with emotions. Therefore, the content should be parallel to the adult's life.” (U2)

Another expert emphasized practicality in permanent learning.

“Gamification can be used to practically teach things that require frequent repetition.” (U3)

4.1.3. Theme 3: Communication, interaction, and collaboration

This theme emphasizes communication, interaction, and collaboration in the educational process. The codes under this theme indicate different aspects of these concepts in education. "Team" refers to collaboration and group work among students, while "Interaction" emphasizes the interaction of participants with each other. "Keeping online" code reflects the time spent online in digital environments. "Sociability" refers to the ability to social interaction and establish relationships, whereas "insufficient interaction" indicates the lack of sufficient interaction during the education process. Finally, "Communication" symbolizes communication for the purpose of transferring information and ideas. The codes under this theme are

important indicators used to understand the interaction and cooperation between participants during the training process.

Table 11. Theme 3: Communication, interaction, and collaboration

Theme	Codes	Participants	n
Communication, interaction and collaboration	Team	G2, M1, M2, M3, M5, M6, U1	7
	Interaction	G1, G2, U2, M6	4
	Communication	G1, G2, M1, M6	4
	Keep online	G1, G2, M5	3
	Sociability	G1, G2, M3, M6	4
	Insufficient interaction	G1, G2, M1, M2, M3, M5, M6	7

The mentors carried out the process in pairs and based on these experiences, they generally talked about the instructive and supportive aspects of working together.

“It was nice to learn a new program together... We both had our strengths and when we work together, we get stronger and can create beautiful things.” (M2)

“Supporting the learning of others and collaborative work always motivates me.” (M5)

“In terms of sharing the tasks, there is a beautiful side of working with other individuals, where different ideas come together and enrich the environment.” (M6)

One expert (U1) indicated “being to individually focused” as one of the most common mistakes made in gamification of educational processes: *“We make gamification very individual-focused. “It should be a little more team-oriented.” (U1)*

Teacher and mentors both mentioned that the issue most felt in the online in-service training experience was the lack of communication and interaction. Participants expressed their expectations for greater interaction with the platform, each other, and mentors: *“...mutual interaction can be further increased.” (G1)*

“Interaction and communication with each other was a deficiency.” (G2)

They emphasized that they want to have more communication with other teachers who experienced the same process in order to better understand their own situation and direct their development. They also expressed similar situations they experienced with

mentors and the difficulties of one-way communication in the feedback they received from mentors.

"I think it would be nice for us if we could reach our other friends and exchange ideas. Only we made our additions, we completed our task, but we could only discuss with our mentors and get comments on how much we completed correctly, and that was at the end of the final process. Feedback was received at every stage. Maybe it would have been better if we took it." (G1)

"It can be used in a much more interactive way when really wanted. For example, we could not see the videos there because they were private. If we could see the videos of other teachers, maybe it would be more effective." (G2)

Teachers pointed out that more interactive environments could be more positive in order to provide more support to other teachers.

"I haven't had a lot of that kind of interaction with other teachers in terms of nurturing, supporting, or collaborating." (G2)

Mentors also stated that the platform has limitations in interacting with each other and with teachers.

"There could have been more interaction, interaction between mentors was limited." (M1)

"Following and interaction remained limited. "We were not sure if the teacher read the resources we shared." (M1)

"It was not an area we constantly controlled, we only used it for mission purposes. In terms of communication, we were not very good at staying online on the platform. "The platform has shortcomings." (M3)

"There were no tools available to interact with the platform." (M6)

One mentor (M6) stated that the interaction between mentors was positively reflected in the feedback processes with the teachers. This allowed mentors to better guide each other.

Yet, some expressed their concerns about the lack of communication and teachers having difficulty asking questions. The mentor also emphasized that communication between teachers is an important factor in the teachers' learning process. In this context, a common focus in shared experiences is on effective communication and how

this communication affects learning processes and the stress caused by lack of communication.

"Exchanging ideas might have relieved us a little bit... I was very stressed at first when I couldn't upload the videos. Maybe talking to each other a little more, hearing and knowing that we all have common problems, might have comforted us a little more in this sense." (G1)

"I felt like there was a little bit of lack of communication on the part of the teachers ... 'If our aim is for teachers to learn, I think communication between them is important.' (M2)

This mentor then made a suggestion to help teachers convey their questions and increase communication: *"A button could have been added for teachers, such as if you have questions, you can request a meeting." (M2)*

Participants emphasized that they needed to increase social interaction in their learning processes. They stated that they have a demand for integrated models that include gamification and social learning in these processes.

"Google Classroom was a platform mostly for us, adults. However, I think it could have made it a little more friendly." (G1)

"It's not really an escape, it's not like any other tool; it's purely for socializing." (G2)

"There is a great need for models that integrate gamification, sociality and even process management into learning." (M6)

4.1.4. Theme 4: Game-based learning

This theme indicates game-based strategies to improve learning as indicated by the participants.

Table 12. Theme 4: Game-based learning

Theme	Codes	Participants	N
Game based learning	Progressive learning	G2, U3	2
	Effective learning	U2	1
	Permanent learning	G2, M1	2
	Microlearning	G1, U2, U3	3
	Tutorial tool	G1	1

Progressive Learning offers a structure in which the difficulty of the tasks increases depending on the teacher's knowledge level. Effective Learning enables teachers to learn subjects more effectively through games. Participant opinions and suggestions regarding these approaches are classified under this theme. Permanent Learning refers to a feature of game-based learning that contributes to long-term retention of information. Participants' views on the relationship between gamification and permanent learning were underlined thereof. "Microlearning represents an approach to learning based on short, focused tasks. Tutorial Tool includes interactive learning tools that guide students and support learning. This theme refers to the design of game-based learning in an effective, permanent and in accordance with micro learning principles.

One teacher (G2) expressed a structure in which the difficulty level of the tasks increased according to students' knowledge levels. This approach offers learners an opportunity to consolidate previously acquired knowledge and gradually learn new information. He stated that gradual learning processes had a positive impact on the learning process as they allowed students to access information gradually.

"While the child thinks he is playing a game without realizing it, he is actually discovering and reinforcing the things he has learned."
(G2)

One expert (U3) emphasized correct planning of the learning flow. Progressive learning processes provide an opportunity to plan a learning flow that suits the teacher's individual needs.

"When setting goals, they should neither be easily achievable nor so difficult that they will be bored. The learning flow must be planned correctly." (U3)

Another expert (U2) pointed out that innovation, social interaction, and peer groups with similar cognitive skills were critical for continuity in the context of effective learning. In this context, effective learning was achieved through curiosity, social participation and imitation.

"There is an innovation effect in learning. This novelty activates the effect. When there is no curiosity and struggle, learning weakens."
(U2)

"When you put the same group of peers with similar cognitive skills side by side, the learning environment suddenly becomes more

meaningful. From where? Because he learns from his friend's reactions. He looks at how his friend solves the problem and imitates it.” (U2)

Two mentors emphasized the importance of associating it with real life and making it permanent for learning to be effective. One stated that gamification made it easier to apply the learned knowledge to new situations, which demonstrated the permanence of knowledge by effectively supporting the practical application process of the learned knowledge.

“Relating it to real life and being able to apply the knowledge I have learned to the situation is the key. “I think gamification can easily achieve this because you present situations with scenarios.” (M1)

The other mentor stated that permanence was achieved through frequent repetition and regular practice.

“I think what makes it permanent is that I do it frequently and regularly.” (M2)

One of the experts also emphasized the importance of reinforcing knowledge through frequent repetitions and gaining targeted habits.

“You should be made to do a lot of repetitions without realizing it. In this way, the desired habit will be gained.” (U3)

Microlearning supports learning by facilitating frequent repetition of training materials presented in small pieces. An expert drew attention to this and indicated gamification as one of the most effective tools for this form of learning.

“Because you want to give a very effective message in a very short time.... People have short attention spans and so you have to be able to get the message across in a short time. For example, when you want to use video as educational material, you should make sure that the content is given in small pieces. Because some people need to watch those videos once to learn, while others need to watch them 10 times. For this reason, tools should be prepared that are compatible with people's own learning speeds.” (U2)

4.1.5. Theme 5: Game types

This theme refers to the game types that teachers prefer in their teaching processes and individual lives. Analog games and digital games under this theme represent different game formats.

Table 13. Theme 5: Game types

Theme	Codes	Participants	n
Game types	Analog games	G1, G2	2
	Digital games	G1, G2	2

Teacher opinions reflect that they prefer to use different forms of games in their teaching processes to enrich the learning experience.

"I play analog, that is, brain games or fun games with children, like board games." (G1)

"No matter what age group, I am very impressed by small games that focus on an interest and arouse curiosity." (G2)

4.1.6. Theme 6: Gamification dynamics

This theme refers to strategies to make the learning process more effective and interesting by gamifying it. The codes under this theme indicate gamification dynamics. Features such as "Feelings", "Escape", "Mystery", "Goals", "Rivalry", "Reversible", "Story-based" and "Follow up" make the learning experience more effective, increase motivation and encourage competition among participants.

Table 14. Theme 6: Gamification dynamics

Theme	Codes	Participants	n
Gamification dynamics	Feelings	U1, U2	2
	Escape	G1, G2	2
	Mystery	M5	1
	Goals	M2, M3, U2	3
	Rivalry	G1, G2, M1, M2, U3	5
	Reversible	M2, U1, U3	2
	Story-based	U1, U2, M2	3
	Follow up	G1, G2, M1, M2, M4, M5, M6, U1, U2	9

Gamification dynamics aims to attract the teacher's attention, increase participation and achieve goals by integrating game elements into the learning process. As a result of interviews with the participants, their wishes and needs for gamification dynamics were determined.

Experts expressed that emotional experiences during the application of gamification could be effective in increasing permanent learning and adopting the content.

“Contacting positive or negative emotions makes learning permanent.” (U1)

“You have to touch both sensually and you have to persuade.” (U2)

The reason to play games for teachers was to get away from the intensity of real life and escape into a different world.

“We leave the environment we are in for a certain period of time, play games and have fun, and then go back to what needs to be done.” (G1)

“It feels so good for children that they forget everything. Maybe when they play, they dive into a different world in a different way.” (G2)

Mystery, for the purposes of this analysis, refers to the feeling of uncertainty and curiosity in the learning process. This sense of uncertainty and curiosity that arises during the completion of tasks encouraged teachers to become more involved in the process. These dynamics, which make the learning process more effective and meaningful, triggered them to learn actively and enrich the learning experience.

“As we complete each mission, it is exciting to wonder what the next mission will be and to think about what we will encounter in the future.” (G1)

“The feeling of curiosity pushes me somewhere. If I’m not curious, I won’t do many things, but curiosity is a driving force that allows me to get in and out of those uncertainties, look at things, or sometimes foresee things and think about them.” (G2)

Nevertheless, one expert emphasized that when setting goals in the learning process, the teacher should have set “attainable” (U2) and achievable goals.

Rivalry or competition was also seen as a motivation-enhancing factor in the learning process. Participants both defined themselves as competitive and mentioned that this competition strengthens their desire to reach a better level.

“...I have a competitive spirit.” (G2)

“Being able to reach a better level is an important source of motivation for me. This adds some competition to the mix. Normally, we do not prefer competition and rivalry in learning environments, but cooperation can also be created through competition.” (M1)

Reversible learning was another subjected mentioned by both experts and mentors. One expert pointed out that mistakes made in the learning processes should be correctable and reversible.

“You did right, you did wrong. Because after saying it is wrong, one should be able to correct the mistake...It should be reversible.” (U1)

One of the mentos gave an example of the positive effects of a reversible learning process as:

“It is important not to break the chain; However, it is also a nice advantage to have a freezing option so that you can continue again once you break.” (M2)

In order to achieve permanent learning and desired behaviors, it is important for the teacher to personalize the content and reconcile it with his or her own experiences. In this context, mentors and experts emphasized that storytelling of the content is an effective strategy to achieve this goal.

“The fact that the subject is conveyed in a narrative way instead of just memorizing it and having scenarios helps it to be more permanent.” (M2)

“Creating a story creates more meaningful gamification to add emotions.” (U1)

All participants noted the potential of tracking progress in the learning process and motivating teachers and mentors. The ability of teachers to monitor their own progress and the development of others and receive regular feedback in this process creates a positive impact. In this context, it is important for teachers to self-evaluate, follow each other and receive feedback for the effective functioning of the process.

“Frankly, I would like to see my own progress. I didn't get much feedback about this progress, I just based it on myself.” (G1)

“Progress tracking, task and responsibility reminders will be effective and efficient when you work with too many teachers and too much data.” (M5)

“We are increasingly recommending both individualized and gamified learning. Participatory learning is a form of learning in which you follow not only your own learning but also the learning processes of others and intervene in the process.” (M6)

Learning tracking is a process in which teachers interact with each other and support learning. This interaction within the group enables inspiration from each other while

encouraging mutual learning. At the same time, individual monitoring can make learning more effective by contributing to students and teachers' understanding of their own strengths and weaknesses.

"Since this project started, I have constantly had this problem: 'I wonder what my other friends are doing?' 'I mean, I wanted to know how I was progressing, what I was doing, what they were working on, how they were progressing. This desire to share was always there for me.'" (G1)

"Deep, good feedback was given. However, I think I cannot clearly see where my scale is and how far I have come." (G2)

"I wonder how other teachers did. Is it better or worse than me? In peer evaluations, teachers were happy to follow others' progress." (M5)

Progress monitoring tools allow teachers to evaluate their performance, achieve their goals, and track their progress along the way.

"For me, the progress bar and the element of unlocking another task as you complete one task create a motivating effect." (G2)

"A little bit, you know, sometimes as you complete the tasks, it's like the percentage and you're at this stage, you know what happens in games, something like that is something that makes me personally happy. Especially in digital trainings, you've completed this percentage. You know, how much is left..." (G2)

"...it provides me with statistical information. I can clearly see which student is at which stage and where. 'This is a source of motivation for me.'" (M4)

Elements like leaderboards and progress bars allow participants to compare their own progress, which can increase competition and motivation. Yet, one expert stated that gamification should be considered beyond this, drawing attention to the feedback.

"It has to be more than just the leaderboard. Feedback is one of the important elements for training. The most important part of gamification should be feedback, and we should focus more on what we can give as feedback." (U1)

4.1.7. Theme 7: Gamification elements

This theme refers to the basic elements used in the process of gamifying the learning experience. These elements aim to increase participant motivation by making the learning environment more interactive and entertaining.

Table 15. Theme 7: Gamification elements

Theme	Codes	Participants	n
Gamification elements	User control	G1, G2, M1, M6	4
	Reminder	G1, G2, M2, M5	4
	Boss fight	G1, G2	2
	Point	G1, G2, M1, M2, M5, U1	6
	Level	M1	1
	Calendar	G1, M1, M6	3
	Badges	M4, M5	2

Gamification elements mentioned by the participants included user control, the ability of teachers to manage their own learning processes, the possibility of following certain tasks through reminders, the excitement of facing challenging tasks with boss fight, measuring and rewarding achievements with the point system, keeping track of the level progress, planning and tracking events through calendar, and badges symbolizing certain achievements. These gamification elements encouraged teachers to be more involved in the process and made achieving learning goals more attractive.

User control was mentioned by teachers and mentors to emphasize the freedom of the teacher to make his or her own planning in the learning processes and to guide them according to their interests and needs.

“Everyone can decide for themselves how to plan.” (G1)

“In some trainings, if I want to deepen that knowledge, I watch other videos he directs me to. I read other sources. I mean, why do I have to be there, in that process, and I have to learn that way. In fact, such a thing does not exist anymore.” (M6)

In this regard, reminders were important tools for teachers and mentors to feel safe and comfortable by enabling them to manage time and complete tasks regularly.

“It was also extremely important that it was structured, of course, having reminders or a time limit, in terms of allocating extra time. So, could we do it ourselves? We could postpone it when we had a lot of work to do.” (G2)

“Having guidance and reminders about which task to do and when makes it feel safe and provides comfort.” (M4)

“We can control some things ourselves, but as a mentor, the tasks I would do automatically came and the reminders that this task would be completed by now made me mentally comfortable.” (M5)

Participant opinions emphasized scoring systems and certificates as extrinsic motivation elements. It was stated that points increased the motivation during the task completion process, and that getting points upon task completion was especially motivating. Rewards such as certificates, badges and titles could trigger extrinsic motivation, according to them, but intrinsic motivation was considered more important in educational processes. In this context, the validity of the scoring system and rewards and their relationship with intrinsic motivation stood out as an important issue.

“The biggest source of motivation was the feedback given by experts.” (G2)

“It's not like a competition, but if there was a scoring system, it would motivate more.” (G2)

“Giving points when the task is completed motivates me and ensures my continuity.” (M2)

“I am a person who loves certificates, badges and titles. But in general, these are extrinsic motivators... What is important to carry out these training processes is to have internal motivation.” (M4)

4.1.8. Theme 8: Gamification mechanics

Gamification Mechanics refers to integrating game dynamics and elements into learning processes. The codes under this theme represent various mechanisms used to enrich the learning experience and increase students' motivation.

Table 16. Themes 8: Gamification mechanics

Theme	Codes	Participants	n
Gamification mechanics	Challenge	G1	1
	Loop	M2, M5	2
	Feedback	G1, G2, M1, M4, M5, U1, U2	7
	Duty	G1, G2, M1, M2, M4, M5, M6	7

Win/Lose states	G1	1
Rewards	G1, G2, M1, M2, M5, M6, U1, U2	8
Reset	G1	1
Chance	G1	1
Competition	G2, M1, M2	3

A quick look at the codes will show that challenge makes learning more effective by giving teachers the opportunity to encounter and overcome specific tasks while loop allows teachers to reinforce topics by making the learning process repeatable.

Feedback supports teachers' development by providing them with information about their performance. It refers to the important sources of motivation in this process by focusing on the participants' experiences of receiving feedback. These opinions emphasize that the participants' feedback received during the process increased their motivation and that teachers had a positive attitude towards the feedback.

“Our motivation increased with the notification of the tasks to be done in the process and the feedback we received from our mentors... Positive feedback constantly motivated us for other activities when the mentors said the task was completed.” (G1)

“Seeing the feedback from my teachers is a serious source of motivation for me.” (M4)

“Teachers were very eager to get feedback and see the results of the analysis.” (M5)

“It could have been an area where teachers also gave feedback, such as, 'You gave such feedback here, but I couldn't understand it,' or 'There is no explanation about it here.'” (M6)

Duty represents this perception of individual responsibility by focusing on the process by which participants complete their tasks in the project. Duty increases teachers' participation by assigning them specific responsibilities and tasks. Few teachers yet several mentors emphasized that their perception of individual responsibility and duty increased their motivation to achieve the set goals.

“Since we are adults and we perceive this project as a direct responsibility and duty, we have tasks at certain times and we have to complete those tasks...” (G2)

“Setting small goals to learn something motivates me.” (M2)

"The item on my to-do list that I mark as done is a motivator for me...When I don't set a goal like, 'I want to achieve such and such success in this field,' it definitely dissipates. The sense of goal is important." (M6)

Win/Lose States allowed teachers to experience success and failure states. Rewards provide celebration of achievements and motivators. Mentors emphasized that rewards, especially certificates and documents, played an important role in increasing the motivation of teachers and students. They suggested measuring their success with clear rewards such as applause, awards or certificates, and that such recognition systems could make the educational process more enjoyable.

"It is important to receive a certificate, an award, or to be given priority in a subject." (M5)

"Let's have a fun reward system, such as a star, to evaluate the teacher's performance. This can help the teacher make the information more enjoyable and entertaining, both at that moment and which can be put into practice later." (M6)

"I also observe this in my students and recommend this training to them. At the end, you receive a certificate, and many students complete this training in order to add this certificate to their CV. Therefore, I think such documents are important." (M6)

Experts emphasized that gamification of rewards in adult education could increase motivation, but that gamification applications should not focus excessively on rewards and should be more feedback oriented.

"Using gamification in adult education can be motivating, but it should not be too reward or punishment focused. "It should be more feedback-oriented." (U1)

"Gamification makes people feel good, both for adults and children. "When people feel good, they are more likely to learn." (U2)

"The reward mechanism is the most primitive but most effective learning mechanism of our brain." (U2)

Reset gives teachers the opportunity to make fresh starts and learn from mistakes. One participant teacher stated that gamification applications' Reset element played an important role in encouraging continuity in the learning processes.

"For example, if it is a learning platform we are talking about, when you don't get into it one day, you have to go back to the beginning. This is a great source of motivation for me. Because there are days

when I forget to log in. Suddenly a warning comes, 'If you don't enter today, you will lose the series challenge.' says. He's right, I have to work today. "At the beginning, I promised to use that platform for 20 minutes every day." (G1)

Competition increases motivation by creating competition and comparison dynamics among teachers. Teachers emphasized that these mechanisms made learning experiences more effective and exciting.

In contrast to a mentor's view against competition, statements about building something together and small competitions can provide a positive experience are associated with the competition code, emphasizing the value of collaboration and small competitions.

"It would be nice to know that I am not the only one and to build something together, even small races." (M2)

"I am against racing because in racing there is a winner and a loser and you are expected to enjoy the process, maybe you will be the loser." (M6)

4.1.9. Theme 9: Motivation

This theme focuses on directing individuals to learning processes, ensuring continuity and supporting development. The codes for this theme represent various strategies to increase teachers' motivation and engagement.

Table 17. Theme 9:Motivation

Theme	Codes	Participants	n
Motivation	Get a habit	M2	1
	Entertainment	G1, G2, M2, M3, M4, M6, U1, U2	8
	Be criticized	G2	1
	Awareness	G2	1
	Volunteering	M1, M5, U3	3
	Integration into daily life	G1, G2, M2, U1, U2	5
	Self-improvement	G1,G2, M1, M2, M4, U2	5
	Obligation	G1	1
	Professional development	G2	1

Motivation	G1, G2, M2, M3, M4, M5, U1, U2, U3	9
Regenerate	G1	1
Guidance	G1, G2, M1, M2, M3, M4, M5	7

"It creates an environment that ensures permanence. I noticed that I use it more, especially in terms of gaining habit." (M2)

When asked to imagine a gamified learning platform, the first statement of one of the mentors was this sentence. They emphasized the effective aspect of gamification in creating habits to provide teachers with ongoing participation and develop regular learning habits.

Entertainment was another concept mentioned by the mentors, who found Google Classroom inadequate in this respect and stated that a platform containing the entertainment element could make the learning process more enjoyable.

"I did not encounter any direct entertainment or motivational elements in Google Classroom." (M4)

"It can make the process enjoyable and entertaining." (M6)

At the same time, one expert also emphasized the importance of fun in the learning process.

"One of the biggest mistakes made in gamification is that we forget about fun... Fun is a very valuable element for learning." (U1)

Another source of motivation was said to be criticism, which encouraged individuals to improve through feedback. Participants stated that being open to criticism had a positive effect on improving themselves and increasing their internal motivation. It was stated that the criticism process supports participants in seeing the results of their work, ensuring their development by receiving feedback, and measuring the level of feasibility.

"What motivates me is that I am more open to criticism of the work I am currently doing. Criticism has always had a positive effect on me in improving myself and moving on a better path." (G2)

"This kind of feedback is nice for me in terms of seeing the results of something I have done, getting feedback, or measuring the level of feasibility." (G2)

"Being criticized increased my internal motivation." (G2)

A teacher pointed out his mentor's guidance in recognizing and correcting his mistakes:

"I especially thank you for letting me reconsider if I am not making this mistake here today." (G2)

This brings us to the concept of awareness, guiding teachers in understanding their own strengths and weaknesses.

Volunteering, on the other hand, aimed to enrich the learning experience with social responsibility and collaboration. One of the experts mentioned the importance of participation in education being voluntary and conscious.

"The most important element in education is volunteering...One must participate willingly and consciously." (U3)

Integration into daily life refers to the strategy of making learning a part of daily life. Two experts emphasized the importance of gamification rewards and points having meanings in real life and stated that it was valuable for these elements to be connected to daily life. Additionally, it was pointed out that associating stories with real life increased the possibility of learning. This indicated that integrating gamification elements into daily life could enrich the learning experience.

"In order for the rewards and points collected in gamification to be more meaningful, it is important to have a real-life equivalent and be made concrete." (U1)

"Stories are very important in gamification...Especially supporting the content with stories related to real life increases the likelihood of learning the content." (U2)

"I am someone who generally focuses on daily tasks and completing tasks, which connects me to the game and generally prefers strategy or survival games. This is an experience that has connections to daily life and includes the dimension of reality, and also progresses with the desire to complete something." for." (G2)

"Self-improvement" focuses on the personal and professional development of individuals. Participants questioned the impact of certificates on their professional careers and stated that what is important is their personal and professional development. It was emphasized that the success of applications that benefit students

in particular creates the happiness and satisfaction of the participants. In addition, the recognition status of the documents and the uncertainty of their use stood out as a factor that could have an impact on the motivation of the participants. Hence, focusing on one's own development and adding value to students were classified under self improvement.

"So, I don't have any expectations such as a certificate or a reward point. What matters to me is what it adds to me and how applicable this experience is in my classroom. This point is really important to me." (G1)

"Such certificates are not very important in our professional career. I can say that it does not make much sense whether or not to get a certificate or not... Maybe small points are given from time to time, but I can say that they do not motivate me. Contributing to my personal and professional development as an individual is more than just points."

"Very few people have the drive for self-actualization. That's why we want to find other reasons to motivate people." (U2)

So, while obligation directs teachers to achieve certain goals, professional development aims to support individuals to progress in their profession.

Motivation is generally associated with increasing the energy and enthusiasm of teachers. In this study, teachers and mentors were asked to evaluate their Google Classroom experiences in terms of motivational factors, which revealed that the user experience of the platform had a significant impact on the motivation of the participants. It was determined that factors such as lack of feedback and boredom could negatively affect motivation.

"It is an application that keeps motivation high because you constantly receive feedback, and your tasks are notified to you. When you enter your task, it says it is completed. This even makes you feel as if you are playing digital games. Now move on to the next section, it makes you feel that way." (G1)

"It wasn't much fun while using it. "It was more boring." (G2)

"As a mentor, seeing teachers upload their videos on time and giving them feedback and completing the task motivated me." (M5)

"I think we can constantly support teachers' motivation with feedback." (M1)

Intrinsic motivation can increase an individual's level of commitment and participation in learning. Personal interests and enjoyment play a critical role in the learning process. Gamification elements can strengthen motivation through continuous feedback, successful completion of specific tasks, and rewards. These elements can encourage student participation, making the learning process more effective and enjoyable. In this context, the opinions received from the participants reveal how motivation can affect individuals' commitment and participation in the learning process and the individual differences that occur.

"It is not very important to get a certificate or not, but for me, it is more important to enter, listen and learn." (M3)

"I already have internal motivation stemming from the joy of working in a field I love." (M4)

"Intrinsic motivation motivates learning. Having intrinsic motivation increases commitment and participation." (U2)

Participants emphasized that the presence of the facilitator during the training process made a positive contribution by creating a sense of security. It was stated that initial guidance was important, especially in cases of lack of information.

"Having a guide in a new project makes me feel safer. In this way, I feel more confident in terms of implementing the project, knowing what to do, and this feeling of confidence makes a positive contribution to the work I will produce." (G1)

"Guidance is very important in the first place. Because we have not yet fully grasped the essence of the matter... I also think this is necessary so that we can move forward in a systematic way." (G1)

"How does he enter the conversation, what does he ask? What does he do when giving feedback? For example, if he were independent and everyone followed their own path, I would try to find out on my own. Guidelines make me comfortable." (M3)

4.1.10. Theme 10: Supportive learning environments

Supportive learning environment is a theme related to the assistance, involvement and expert support offered to teachers and participants.

Table 18. Theme 10: Supportive learning environments

Theme	Codes	Participants	n
Supportive learning environment	Support	M1, M5, U2	3
	Participation	G1	1
	Expert support	G1, G2, M1, M6	4

In this context, support refers to providing general support to students or participants. Answering teachers' questions, guiding them and increasing their motivation are included in this regard. Participation refers to the level of engagement of participants. Active participation of teachers can make the learning process more effective and create a community among students. Lastly, expert support means that subject matter experts guide students and share their specialized knowledge and experience.

Mentors stated that teachers were unable to establish support networks due to lack of communication with each other and difficulties in sharing resources. To improve this situation, mentors found it important to increase interaction between teachers and encourage resource sharing.

"If teachers had more communication with each other, they could benefit from each other's experiences and be more helpful in supporting each other." (M3)

"Other teachers did not have access to the resources I gave teachers regarding their individual videos. "If there had been a common department, we could have supported teachers more." (M6)

The findings revealed that teachers and mentors found expert support valuable and saw this support as a factor that increased their motivation.

"When someone who is competent observes my work and gives positive and nice feedback, it motivates me and makes me more curious." (G2)

"An important variable in motivation sources is being able to reach field experts directly." (M1)

Teachers emphasized that they cared about their students learning by having fun together and that games contribute to concentration and development of self-confidence by increasing participation.

"...while having fun together, they also experience the pleasure of learning." (G1)

“I attach great importance to the place of games in education for learning... games are very effective in gathering distracted attention. “It also allows us to be in dialogue with each other in the classroom... I think participation in the games also increases their self-confidence.” (G1)

4.1.11. Theme 11: Design

Design refers to the design and user experience of an education platform and included findings from the obtained data interpreted under the following codes: focused design, universal design, advanced gamification, discoverability, user friendliness, multisensory, gamified interface, gamification elements, and advanced platform design concepts.

Table 19. Theme 11: Design

Theme	Codes	Participants	n
Design	Focused design	G1, U3	2
	Universal design	G1, G2, M5, U3	4
	Advanced gamification	G1, G2, U1	3
	Discoverability	G1, G2, M3, M4, U2	5
	User friendly	G1, G2, M2, M3, M4, M6, U2, U3	8
	Multisensorial	G1	1
	Gamified interface	M5	1
	Gamification elements	M6	1
	Advanced platform design	G2, U1, U2	3

Focused design improves the learning experience by allowing the user to focus on specific goals while universal design refers to making the design universally understandable and usable to facilitate access to various user groups. Advanced gamification includes advanced gamification elements and mechanics, which can make learning more interactive. Discoverability aims to enable users to easily discover content and features. User friendly refers to user-friendly design and interface. Multisensory emphasizes the learning experience that involves more than one sense. Gamified interface refers to interface design that includes gamification elements. Gamification elements include gamification elements and mechanics. Advanced platform design means that the overall design of the platform is advanced and user-

friendly. These concepts are important for effectively designing educational platforms and improving user experience.

During the research process, teachers and mentors used Google Classroom for the online in-service training. Based on their experience with the platform, the participants stated that performing different transactions on the same platform provided significant convenience for them. They also stated that teachers and mentors who used other web tools quickly adapted to similar technologies and could easily interact with standard interfaces.

“The platform was very good in terms of reaching us with your notifications, ensuring communication through this platform and receiving feedback.” (G1)

“There should be a platform that is very practical, at our disposal at all times, where we can do things alone and also interact with others online.” (G1)

“... notifications come directly to the homepage, each section is categorized and can be accessed very easily. It is also easy to reach backwards. I think it is a highly usable platform.” (G2)

“Although I am not very familiar with technology, I used Google Classroom easily during the education process and found it user-friendly.” (M3)

“Google classroom was both very useful and had a simple interface.” (M6)

When teachers were asked to evaluate Google Classroom in terms of gamification elements, one teacher stated that the platform was insufficient and added elements that could be in a gamified interface, but none of them were included in Google Classroom.

“If we evaluate Google Classroom, I do not think there are many gamification elements... It is not a platform with progress bars, badges, avatars.” (G2)

A mentor also thought that a gamified professional development program would positively affect teacher motivation.

“When I think of it as a professional development program, something can be done to encourage teachers to participate in the program and ensure continuity, perhaps motivational or gamifying.” (M5)

In the opinion of an expert, although the current system had some basic gamification elements, there was an expectation of more advanced gamification elements or platform design elements.

“He completes the task, earns points, levels up, opens new content, earns a badge... I have never seen a system beyond these.” (U1)

4.1.12. Theme 12: Technical infrastructure

Technical infrastructure covers the basic elements that affect the operation and user experience of an education platform. Cloud storage determines the way the platform stores and accesses data. System speed indicates the speed of the platform and how quickly users can interact. Technical problems include the technical problems encountered by the platform and the solution processes for these problems. Data security refers to the security of the data on the platform.

Table 20. Theme 12: Technical infrastructure

Theme	Codes	Participants	n
Technical infrastructure	Cloud storage	G2	1
	System speed	M5	1
	Technical problems	G1, G2, M2, M3	4
	Data security	M4	1

Teachers and mentors focused on various factors when evaluating the technical infrastructure of the platform. Regarding cloud storage, the importance of storing data in a secure and accessible manner was emphasized. Regarding system speed, it was stated that the fast operation of the platform positively affected the users' experience. Technical problems were discussed in terms of effectiveness and speed of the solution processes of technical problems. Under the concept of data security, teachers and mentors showed sensitivity about the privacy and security of student data. These thematic codes also included evaluations on the robustness, speed, security and problem-solving capabilities of the technical infrastructure.

Teachers and mentors were also said to experience difficulties in their Google Classroom use, especially in video and media uploading processes. However, it was stated that these technical issues were generally solvable and do not negatively affect the overall functionality of the platform.

"I had trouble uploading the video. However, after uploading the video, everything went smoothly and smoothly." (G1)

"I had a lot of problems uploading photos and videos." (G2)

"If the platform were public, it would have limitations in supporting too many participants at the same time." (M5)

4.1.13. Theme 13: Usefulness

Usefulness refers to the usefulness, accessibility, and ongoing access characteristics of an educational platform. Equality, Ease of Use and Permanent Access are the subheadings of this theme.

Table 21. Theme 13: Usefulness

Theme	Codes	Participants	n
Usefulness	Equality	G2	1
	Ease of Use	G1, G2, M6	3
	Permanent access	G2	1

Equality highlights the education platform's ability to provide an equal experience among users. Ease of use shows whether the platform is user-friendly and users' ability to easily understand and use the platform. A user-friendly interface enables teachers and mentors to use the platform effectively. Permanent access refers to the ability to provide continuous and permanent access to educational materials. This means ensuring students and teachers can access the information they need anytime, anywhere.

The opinions of teachers and mentors included their evaluations of the usefulness of the platform within the framework of these codes. With the information obtained from the opinions, the user experience, accessibility, and permanence features of educational platforms could be analyzed in more detail.

According to the teachers and mentors, Google Classroom was simple and effective in terms of usability. Additionally, it was stated that access to the materials was easy and the layout of the platform was legible. This indicated that users could easily adapt to the platform and were satisfied with its functionality.

"I started using [Google Classroom] for the first time within the scope of this project, but the application was very easy and effective." (G1)

"Access to materials is easy and I like classroom in this sense." (G2)

"I would prefer a place where there is a fixed writing style and a legible layout, rather than a platform like this where you have to edit everything. It is also important that where you put the video can be easily adjusted." (M6)

One teacher stated that the feedback received through Google platform in the evaluation part was kept accessible and open. This was said to be a good feature since it gave the chance to evaluate and improve the work over time.

"It is still open, I can even open it from time to time and see my work. Since it is not closed, it makes me happy to read my feedback again by constantly logging in for the long term." (G2)

Some themes and codes revealed different views among participant groups. Details of these differences are given below.

Table 22. Reward and motivation concepts in terms of themes, codes and participants

Themes	Codes		Participants		n
Gamification mechanics	Feedback	G1, G2	M1, M4, M5	U1, U2	7
	Rewards	G1, G2	M1, M2, M5, M6	U1, U2	8
Gamification elements	Point	G1, G2	M1, M2, M5	U1	6
	Badges		M4, M5		2
Motivation	Integration into daily life	G1, G2	M2	U1, U2	5
	Self-improvement	G1, G2	M1, M2, M4	U2	6

There are multiple different themes and codes on the relationship between reward and motivation. The opinions of all groups regarding these codes are presented in Table

22. On this issue, there are marked differences between the perspectives of teachers, mentors and experts. In the interviews held between the groups, teachers, mentors and experts stated that the certificates, professional points or titles to be obtained as a result of the training process were motivating. However, each group evaluated their priorities for reward and motivation in different ways.

While teachers and experts gave more harmonious responses regarding rewards, the mentor group's responses differed clearly from the other two. Teachers considered the achievements to be student-focused and being able to transfer what they have learned to students in an applicable way as indicators of success. Because of their tendency to think pedagogically, teachers generally answered the questions from a student-centered perspective, despite the researcher's reminders. This situation emphasized the sensitivity of teachers in applying their achievements to students and integrating them into real life.

Experts also emphasized that for adults, learning outcomes that could be integrated into life, made tangible, and linked to the individual's life would increase their motivation. Mentors, on the other hand, stated that certificates, scores and titles provided motivation as much as personal development. It was noteworthy that a prestigious certificate or title is an important source of motivation for mentors.

One teacher pointed out that the achievements gave student-oriented direction to their professional development.

“I thought that certificates were of great importance at the beginning of my career. Over time, this feeling lost its meaning for me. Now, these documents no longer have any significance to me. The only thing I focus on in every project I undertake is to contribute to my students and teach them something different... Kids need to know that this is my priority in every project I do. It is very important that they understand and realize what I teach them. “There are moments when we sacrifice ourselves for children, which is why we teach.”
(G1)

An expert who expressed his opinion on reward and motivation emphasized that rewarding learning success was an effective motivation tool and stated that adult motivation and participation are closely linked to the fact that these rewards touch a point associated with the individual's life.

“The most evolutionarily primitive and effective mechanism in the physiology of human learning is rewarding success as motivation in learning.” (U1)

“You have to touch a point in his life both emotionally and you have to persuade.” (U1)

Mentors, on the other hand, were motivated by receiving more concrete responses.

"It is important to receive a certificate, an award, or to be given priority in a subject. For example, one of the best ways for a researcher to show that they are a good researcher is to be a referee in journals. That is why I completed many trainings, in order to get refereeing and prove myself." (M5)

The congruence between teacher expectations and expert practice, as well as differences between mentor expectations and other groups, were particularly highlighted. Teachers desire to apply what they learn to real life. Experts recommend highlighting achievements that the teacher can make connections with and apply from his own life and creating a feedback-oriented process rather than reward- or punishment-oriented designs. There is significant harmony between teachers and experts on this issue.

The approaches of teachers, mentors, and experts to the issue of gaming habits, entertainment and gamified platforms also vary even within the group. There is some conceptual uncertainty regarding the concepts of game-based learning and gamification, especially among teacher groups.

Teachers have habits of playing games in their daily lives. Sometimes they play games with their students, sometimes with their own children, and sometimes individually. This situation is a source of motivation for them, such as escaping from their environment or having a fun time from time to time. At the same time, teachers are eager to bring these gaming experiences to their classrooms.

When they were asked to describe their dream gamified education platform, their answers reflected their thoughts and expectations regarding the gamification concept. Some stated that they thought that the entertainment element of the game would distract from the main purpose of the learning environment.

“... in learning through fun, fun can come to the fore and deviate from its function. That's why it's okay even if it doesn't happen.” (G1)

"This is a very unnecessary thing for me. If it aims to motivate me in the process, I don't need it. "I already have motivation. If I have to do this task, I will do it." (G1)

"There should not be unnecessary details and it should be clear." (G1)

"Maybe this will motivate the kids more. It wasn't very appealing to adults." (G1)

Here, we must distinguish between business and leisure. Teachers are willing to play games, but they do not prefer a platform where the game and a gamified platform are too intertwined with each other, especially where entertainment is at the forefront, and they are concerned that this will prolong the learning process.

"The only goal should not be to earn points, it should be quality shares." (G1)

"I think our time is more valuable than spending hours on eBay and earning points." (G1)

Teacher groups' concerns about the idea of a gamified platform generally focus on the perception that the game is only for children and the creation of a design suitable for the target audience. They mentioned that if gamification is applied to the target audience, it will motivate them during the learning process.

"I turned it into an area where they think they are basically playing games, but where they gain lessons, and it is very fun... I would like the same thing, that is, if they turned what I want to learn into a game, I would love it if I could get it that way." (G2)

"Game is good for everyone. No matter how old he is." "It has a healing aspect." (G2)

"Why not have a game between the modules? Maybe it will make us rest, maybe it will make us think, maybe it will increase our curiosity..." (G2)

"As long as it's age-appropriate, why would we say no to a gamified platform? If it's too childish and insincere, it can get boring." (G2)

One of the most exemplary applications among teacher groups was Duolingo. Teachers mentioned that the gamified learning environment in Duolingo had a positive impact on their language learning (Duolingo website, 2024). In particular, teachers emphasized the comfort of being able to individually guide the process and having

constant reminders within the application. In this context, one of the important points for teachers was that reminders were made in accordance with individual preferences.

“I would like to give a good example on this subject. I am studying languages in Duolingo. The application puts you in a ranking with the teachers of that language, but it does not impress me at all. But it has a nice feature: if you don't enter it one day, you will be back to the beginning. This is a good source of motivation for me. For example, it gives a message that if you do not enter today, you will lose your serial fight. In the beginning, I promised 20 minutes to that platform every day, he is right. Again, it is about my choice, I take the warning and reminder accordingly.” (G1)

Mentors also mentioned Duolingo as an example (Duolingo website, 2024). It is a gamified platform suitable for adult learning. One mentor emphasized the importance of reversibility as a reason for preference accordingly.

“Having options such as freezing when a day is missed in Duolingo provides a fun experience and prevents the person from losing motivation due to a failure. “It is very useful in this respect.” (M2)

Although most of the teachers initially showed a thoughtful approach to the idea of a gamified platform, mentors, unlike teachers, approached this idea directly positively. For teachers, there was a concern that this approach may initially over integrate the entertainment element into the environment and carried the risk of distracting from the main goal. However, mentors thought that gamification created opportunities for permanent learning, participatory learning and individualization in learning processes, which form the basis of learning, rather than the entertainment element, and emphasized these basic points. Different perspectives have emerged on the point that gamification can make a significant difference in the learning environment.

“Being able to apply the knowledge I have learned to a new situation is a key point. Gamification is a tool that can enable this very easily, because you can present certain situations and scenarios.” (M1)

“I believe it motivates students externally, and the feedback we received at the time supported this.” (M4)

“There are serious educational elements behind gamification. These elements show how gamification is combined and presented into an effective interface and user experience. In this context, I find its future potential and the value it provides quite important. However, it is important to plan these background factors well.” (M5)

“We prefer both individualized and gamified learning. However, we place more emphasis on the individualized learning model. This goes beyond just focusing on a specific topic; it also has the potential to deliver personalized learning experiences. This reflects the fact that today people desire a more effective and personal learning experience, where participatory learning is a necessity.” (M6)

When experts were asked about their thoughts on the idea of gamification in adult education, they stated that all age groups play games, without any discrimination, and they mentioned the positive reflections of a gamified learning environment. They approached the learning process not as a game or an environment with only an entertainment element, but more generally, believing that this idea would have a positive impact in this field.

“I believe that gamification should be applied at all levels in education. Even after receiving a university education, I believe that fun and entertainment contribute significantly to the learning process. Therefore, I support integrating gamification as much as possible and believe that this method contributes greatly to learning.” (U1)

“When we think about it from both an adult and child perspective, the most prominent feature of gamification is this: It makes people feel good.” (U2)

“Throughout history, people have been driven by competition, play and goals. Therefore, the idea that adults do not play or cannot learn through games is not valid.” (U3)

4.2. Researcher's Observation Notes

Observation stands out as an effective data collection strategy among research methods. This method involves the researcher personally examining a carefully selected topic, event, or process and recording his observations (Malinowski, 1922; Smith, 2018). Observation is usually carried out in a detailed and systematic manner for a specific purpose; In this process, events are examined in their natural environments (Jones, 2020b; Whyte, 1943). The main goal is to comprehend, describe and analyze events.

During observation, the researcher can take on the role of participant observer and become directly involved in the event (Brown, 2021; Creswell, 2014). This approach allows the researcher to participate in the event and try to understand the participants' perspective. This interaction can give the researcher a more in-depth and emotional understanding. Additionally, the participant observer role provides significant advantages to the researcher by strengthening the ability to establish causality and make inferences (Cohen, Manion, & Morrison, 2007; Gay, Mills, & Airasian, 2012).

This thesis study involves a process in which the researcher assumes the role of participant observer. For two years, the researcher worked on a project in collaboration with participating teachers and mentors and focused on answering various research questions with the observations he made during this period.

Among the questions primarily examined during this observation process are the following: How are teachers' and mentors' perspectives on transferring professional development training to digital platforms shaped? What are the weaknesses and strengths of online education for the participants, and which strengths and weaknesses are particularly evident in terms of motivation? What are the participants' attitudes and mindsets towards the use of gamification in teacher education?

In this context, a detailed analysis was carried out on which gamification element is more effective for which type of player, focusing on the concepts of motivation and interaction. Additionally, learning about the participants' proficiency and preferences in technology use is among the aims of this study.

At this point, an evaluation will be made in a broader context, covering issues such as how teachers and mentors evaluate digital platforms, their strengths and weaknesses in online education, and the role of gamification in teacher education. Thus, it will increase the comprehensiveness of the study and allow the data obtained to be evaluated in a broader perspective.

These observations aim to systematically understand participant opinions and experiences regarding professional development training through online education, gamification and digital platforms. The main goal of this study is to understand the participants' thoughts on the subject in detail, to examine innovative approaches in the field of education in depth and to develop a gamified education model.

The training process was shaped by the training content presented to the participants via Google Classroom in six-month periods. During this period, the performance of the participants was observed using observation tools such as video, text, scale and observer notes. Training content monitoring and feedback processes were regularly implemented by a participant observer. Expectation and information meetings held with teachers at the beginning of the period were supported by evaluation meetings at the end of the period. Process evaluation and planning were carried out in monthly meetings with mentors. The results obtained through evaluation scales presented to teachers in different fields were evaluated. In addition, individual attention was paid to the problems faced by teachers regarding the use of platforms and technical equipment, and notes were taken regarding these problems. This observation environment was supported by various observation tools in order to understand the participants' experiences in the education process and make the process more effective.

The researcher focused on four main themes by evaluating the data obtained through observation notes. Firstly, on the subject of "Transferring Professional Development Training to Digital Platforms", the difficulties encountered by teacher candidates in this process and their perspectives on digital platforms were examined in detail. Then, under the theme "Weaknesses and Strengths of Online Education", the strengths and weaknesses of the participants' online education experiences were determined, and the motivational effects were focused on. Thirdly, under the theme of "The Effect of Gamification on Teacher Education", the attitudes of prospective teachers towards the use of gamification and the effects of this approach on the education process are discussed in detail. Finally, under the theme of "Competence and Preferences in the Use of Technology", the skill levels and preferences of the participants in the use of technology were investigated and technical difficulties and solution suggestions in the education process were determined. These analyzes provide a thematically organized summary of data systematically recorded by the observer.

The four main themes the researcher focuses on are parallel to the flexibility and ease of access that online education provides to participants. In this context, there are important connections between teacher candidates' experiences on digital platforms, the strengths and weaknesses of online education, the impact of gamification on teacher education, and the participants' proficiency and preferences in technology use.

A positive perspective is observed towards the digitalization of teachers' professional development processes. Teachers, who quickly adapted to online education, especially after the pandemic, tend to benefit from the flexible time and space advantages of training on digital platforms. These teachers state that online training is preferred because it provides participants with time and place independence for professional development.

Many of the teachers stated that their participation would not have been possible if the training had not been online at the beginning of the process. This situation has enabled teachers, who have intense responsibilities such as daily rush and ongoing school process, to participate more easily in the process with online education. The project process covers a period of six months and the participants completed this period in two different groups via online platforms. These six months, which are a long time especially for experienced teachers, have been used efficiently with online education.

A face-to-face meeting was held with teachers only once throughout the process, during the evaluation meeting. Even scheduling these meetings on the same day for all teachers has been a challenging process for one day. It is emphasized that online education allows such meetings to be held easily.

The observer's evaluations regarding the evaluation of the strengths and weaknesses of online education from a motivational perspective are as follows:

Online education provides flexibility and ease of transportation to participants, allowing access even from outside the classroom, depending on geographical restrictions. Since it is an online platform, the need to determine a common day for everyone or to gather in one place has been eliminated. This has made it much easier for individuals in different positions to receive this training simultaneously.

Google Classroom is an effective tool that makes it easy for the user to share course materials and resources. Although the tasks assigned to teachers and mentors during the project process were communicated at certain date intervals, the flexible structure of the platform allowed participants to have full control over the upload and application processes. This flexibility allows participants to adapt to their individual learning styles, giving them the opportunity to progress at their own learning pace and at their own convenience.

Using Google Classroom provides the advantage of managing the project process from a single center, eliminating the need for multiple platforms. This has facilitated the monitoring and management processes for both mentors and managers. The need to constantly control or manage various areas is eliminated. At the same time, all participants were able to access this platform from anywhere with a single e-mail address. This integrated approach provided participants with a more effective learning experience by supporting effective learning management.

However, the technological problems that participants encounter on the Google Classroom platform sometimes appear as a limiting factor in their interactions. For example, despite the user-friendly interface, participants felt the need for time and guidance in familiarizing themselves with the interface and performing tasks on the platform. This shows that the diversity in platform use and differences in technology use bring potential difficulties in adapting to online education.

Participants had difficulties in performing tasks due to reasons such as limited access to technology at home, internet problems, and problems with individual technological products. For example, in the feedback he received from a participant teacher, "... I had trouble uploading videos to the platform. Therefore, I had to send some of the videos to your e-mail address via WeTransfer." She stated that she had a problem like this. Similarly, in the responses to the evaluation scale used, "Only the infrastructure of the video upload system can be strengthened." The statement shows the technical difficulties of the platform. Such problems are usually caused by internet speed and are a common experience for many participants.

This observed situation shows that teachers who are accustomed to the traditional teaching environment are not fully ready for the digital education process. These challenges emphasize the importance of teachers going through a more effective preparation process for this new paradigm change in order to effectively manage the transition to the online learning process. In this context, ensuring that participants are more effectively prepared for online learning is a critical need to carry out educational processes more effectively. Another important observation that supports this situation is that the preliminary preparation of the participants regarding the digital education process is lacking and such difficulties are discovered during the process.

The observer's evaluations regarding their competence and preferences in using technology are as follows:

In the light of observations regarding the motivational evaluation of online education, another important element in training offered through digital platforms is interaction. In this context, it is possible to examine interaction under three main categories: Student and content interaction, student and teacher interaction, student and student interaction. The observer evaluated the participant teachers by taking into account that they took on the role of students and the mentors took on the role of teachers.

In the context of student-content interaction, factors such as the student's study style, access to learning tools and use of technology play a decisive role. This interaction occurs through the student's interaction with the learning materials and can strengthen the student's internalization of knowledge by increasing the student's level of understanding of the subject. Additionally, interaction with the content can allow the student to have a learning experience that suits his or her own learning pace and learning style. In this context, student-content interaction is considered an important factor in the development of effective learning strategies in digital education (İşman, 2022).

Regarding teacher and platform interaction, Google Classroom did not provide an equal level of interaction satisfaction for a group of participants who differed in technology skills. This is due to the fact that participants need time to adapt depending on factors such as their level of readiness in the use of technology or their involvement in online education for the first time. Although the platform has a standard interface, users took time and guidance to become familiar with the interface and perform tasks on the platform.

In this context, a study examining Anderson's (2008) online learning theory focuses on the time and guidance needs of participants in the process of getting acquainted with the standard interface and performing tasks on the platform, emphasizing the potential difficulties in adapting to online education, especially due to differences in technology use. In addition to a guide prepared by the researcher on the use of the platform, the tasks were clearly named and were expected to be carried out by following the steps respectively.

These observations are compatible with the results of the scale study conducted by a different researcher of the same study group. The study in question includes factors representing teachers' proficiency and readiness levels in the use of technology. In particular, camera usage knowledge is intended to measure technical knowledge in the recording process. According to the descriptive analysis results, the average obtained in the dimension of camera usage knowledge indicates the need for support for the participants to improve their skills in this field. This scale also measures a teacher's knowledge and skills regarding camera use in the classroom (Arabacıoğlu et al., 2022).

At this point, the observations provide an important perspective on the support and guidance needed by the participants, highlighting the diversity in technology use and the difficulties experienced in adapting to this diversity.

Considering that in this process, the participating teachers assumed the roles of students and the mentors assumed the roles of instructors, the level of interaction between teacher-teacher and teacher-mentor in the training conducted on Google Classroom has been a frequently brought up issue. Difficulties in participants' interaction with each other arise from the limitations of the platform used.

An issue emphasized by teachers in the project evaluation meetings is the low level of interaction with other participating teachers on the platform. In particular, the lack of opportunity to communicate one-on-one with other participants who share similar processes is a situation that teachers frequently express and feel uncomfortable about. Participants frequently expressed their desire to learn more about each other's situation, share more about their experiences, and collaborate. As a matter of fact, the teachers got to know each other during the evaluation meeting and stated that they preferred to have met before and to keep in touch throughout the process.

Teachers encountered limited interaction with their mentors because there was a lack of an environment where they could get instant reactions. This situation emerged as a deficiency resulting from the lack of an area where teachers could express their thoughts on the feedback they received from their mentors and discuss it online. In this context, it has been observed that teachers have difficulty in directing their own development in the process. Teachers desire to be able to convey instant feedback to mentors. The feedback provided to teachers during the project process was delivered to some through online documents and some through online interviews. At this point,

it has been determined that teachers' preferences for online feedback are mostly in favor of online interviews.

The observer's assessment of the impact of gamification on teacher education is as follows:

In this theme, the observer emphasizes the critical role of gamification elements in educational content.

According to research conducted to increase motivation in education and involve learners more effectively, gamification elements have the potential to enrich the learning experience (Johnson & Brown, 2019). Effectively integrating these elements can play a key role in engaging the learner, increasing engagement, and making the learning process more enjoyable. It is important to determine how these elements can integrate gamification into the learning experience and encourage more effective learner engagement.

Effectively applying the skills acquired through online education to daily life has the potential to turn learners' digital skills into practice (Brown, 2019). Interaction and communication between colleagues have made a significant contribution to teachers enriching their own practice and successfully integrating scientific thinking into their daily lives. In this context, teachers' sharing of the knowledge and experiences they have gained with each other not only improves their own practices but also creates a positive impact among their colleagues. These shares were frequently emphasized in mentor-teacher meetings. One mentor noted how the teacher successfully applied the skills of gaining different perspectives and questioning to different areas in their daily lives. Therefore, it has been stated that a teacher tends to solve the difficulties in daily life through the steps of scientific thought and research process.

The participant observer carefully followed the process in terms of duties and responsibilities, calendar progress, and platform updates throughout the project process. Each week, it provided detailed information to participating teachers by creating a special section for the relevant level on Google Classroom. In this briefing, detailed information was given to teachers about what they need to do, the determined deadlines and the methods to be applied.

In the notes he took throughout the process, the observer observed that the majority of teachers completed the tasks after the first reminder or before the last reminder date.

However, she noted that some teachers did not carry out the tasks directly or postponed them until the final reminder. This situation emphasizes the importance of teachers having multiple responsibilities in daily life and reminders to ensure continuous continuity in online training.

The observer highlighted that it is important to adopt regular information, reminder and follow-up strategies to manage the process effectively. It appears that such strategies are an effective tool for increasing teachers' engagement and task completion rates in distance education.

Increasing difficulty levels and tasks over time stand out as the basic elements of gamification and are considered an effective strategy for motivating teachers (Deterding et al., 2011). This situation reveals teachers' efforts and development processes in transitions between levels. In light of the feedback they received from the previous level, teachers had to make an effort to reduce their deficiencies or mistakes at the next level and to reinforce the behaviors for which they received positive feedback. This created cycle contains difficulties in terms of the development of teachers' professional skills and also has difficulties in determining the expectations of mentors from teachers.

To prove this, when we look at the results of the studies carried out by teachers at the fourth level, we see that they realized how far they were from the nature of scientific inquiry at the beginning. In this context, it was mentioned in a teacher workshop that a teacher stated that he learned scientific inquiry during the e-mentoring process.

Rigby (2015) reveals an important perspective on the element of curiosity by emphasizing the importance of strengthening learners' intrinsic motivation and enabling them to participate more effectively in the learning process. In this context, two activity boxes created for teachers at level 2 and level 3 were sent to teachers with previously unknown contents. The teachers discovered the contents of the boxes when they received them. It has been observed that this element of mystery attracts great attention from teachers and increases their curiosity about what kind of box will come at the next level. It has also been stated that students are also curious about this mystery and constantly ask about it. Expressing their excitement, the participants stated that this element of mystery created during the box delivery process made teachers more

curious and excited. This highlights the potential of using curiosity as an effective motivational tool in the learning environment.

Throughout the education process, teachers preferred game-based education in their lesson practices and developed games suitable for the relevant subject. The documents shared with the project team at Level 4 are an indication of teachers' adoption of this approach. At the evaluation meeting, teachers emphasized that gamification was reinforcing and fun for their students.

A teacher used the phrase "Would you like to play a game?" during the evaluation meeting. This question has emerged as a successful strategy to attract attention and increase participation. The "Finger Grab" game brought the participants together in an interactive way and emphasized its social, interactive and participatory features. At the end of the game, the participating teacher reminded the prospective teachers in the hall that they could play similar games with their students in their classes. This shows that teachers have been benefiting from the social, interactive and participatory features of the game for a long time. However, they may sometimes have difficulty imagining themselves as users.

Feedback is important as a critical element that provides guidance to participants in gamification processes (Smith, 2022). The feedback received from mentors contributed to the individual development of teachers and guided them in the transition to the next level.

A participating teacher used the following statement regarding the feedback he received from mentors: "It was great to receive feedback from my mentors. Seeing what I did right and being reminded of my shortcomings contributed to my development." This explanation shows that the feedback received allows teachers to understand their own strengths and weaknesses, to be guided in line with this information, and to make progress through this process.

At the same time, accurate and effective feedback can increase user motivation and strengthen the learning experience. Teachers are curious about the results of their individual progress through the feedback they receive from experts at the end of each level. Feedback received in the form of online documents or online interviews provides teachers with guidance for the next level. This process contributes to the development

process by providing participating teachers with valuable information about their own performance.

In this context, the importance of feedback mechanisms in gamification processes in providing an effective learning experience is emphasized. Accurate and meaningful feedback can strengthen interaction in education by enabling teachers to actively participate in continuous learning processes.

Combining certificates with elements such as titles in training can make learning more attractive and motivating through gamification methods and encourage participants to participate in training in a success-oriented manner. Jones (2020a), with his findings in his research on the effects of gamification in education, suggests that integrating certificates with gamification methods can increase learner participation and success. As a result of the project process, teachers were motivated to complete the project because they had the opportunity to obtain a recognized certificate and earn points in their professional careers.

In this context, observations on the role and effects of gamification in education reveal its potential to contribute to the professional development of teachers.

4.3. Survey

This research used the gamification player types scale, developed by Tondello based on the Marczewski (2015) model and adapted into Turkish by Taşkın and Çakmak (2020). This instrument was applied to a total of 20 teachers and 6 mentors in order to support the qualitative dimension of the research. This scale aims to identify player types by classifying users according to their motivation types. It consists of 6 categories and 24 items. Each category has 4 items. These categories are achiever, philanthropist, free spirit, socializer, player, disruptor. These categories "Achiever, Philanthropist, Free spirit, Socializer" represent intrinsic motivation, while "Player, Disruptor" represent extrinsic motivation.

According to the findings, the scoring distributions of the participants are shown in Figure 12. While participants gave higher scores in profiles representing intrinsic motivation, they gave lower scores in profiles representing extrinsic motivation.

This shows that, through the results obtained, it was determined that teachers exhibited a higher level of motivation in factors that support intrinsic motivation.

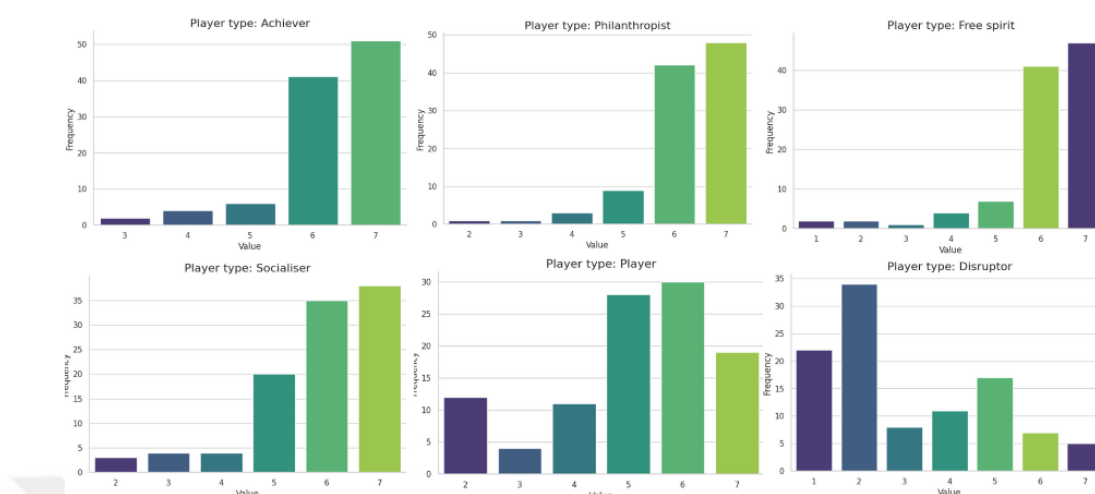


Figure 12. Scheme of player types categories

According to the survey results, how many people preferred each player type is shown in table 23. The "n" values in the table indicate the number of participants who gave at least 5 or more points to the items of the relevant category. This table shows the preference status for each player type according to their high score values. A score of 5 means "Somewhat agree", a score of 6 means "Agree" and a score of 7 means "Strongly agree". This scoring system reflects how strongly participants express their opinions about a particular category or type of player. Each player can represent more than one category.

Table 23. Player types

Category	n
Socializer	21
Free spirit	20
Achiever	24
Philanthropist	24
Player	14
Disruptor	1

The scoring averages of the categories are as visualized in Figure 13. Based on the grade averages, it is observed that the profiles that best represent the participants are as follows:

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

Based on the results in which they rated the statements directed to the teachers, these findings indicate that the participants stated that Deci and Ryan's (1985) motivational needs of people are based on psychological needs such as competences, autonomy, and relatedness. The psychological foundations mentioned here include elements that represent teachers' first choices. Achievers, who are rated the highest by the participants, are motivated by competences, philanthropists are motivated by purpose, free spirits are motivated by autonomy, and socializers are motivated by relatedness.

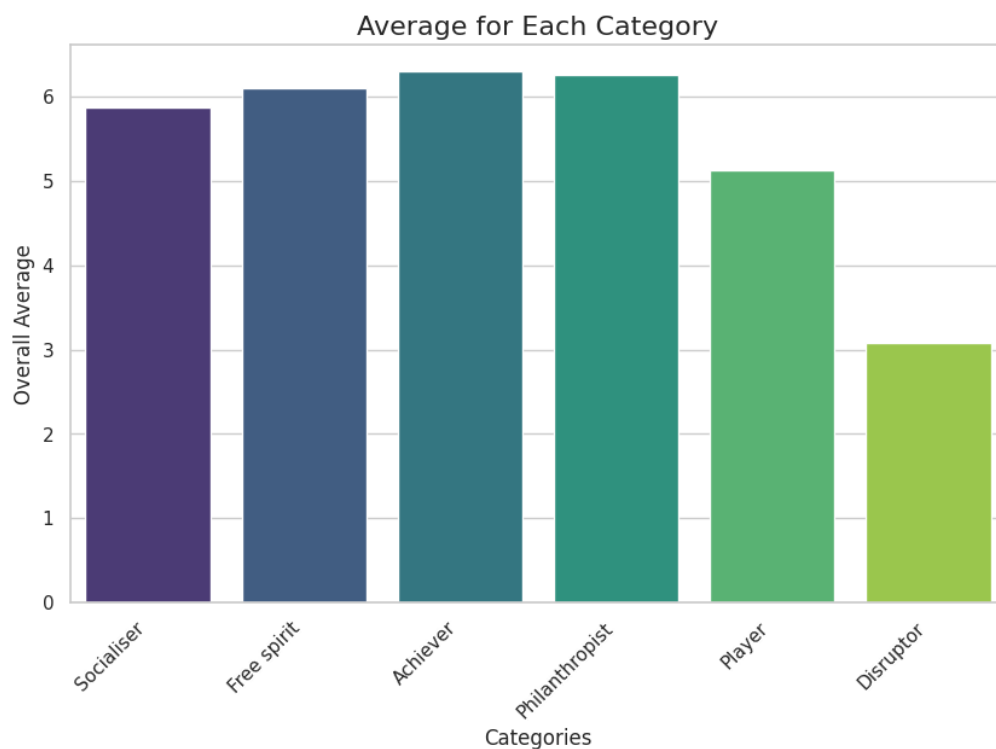


Figure 13. Scheme of average for each category

Achievers, who represent teachers' desire to acquire new skills, Philanthropists, who demonstrate high responsibility skills, and Socializers, who care about the positive effects of social connections on their motivation, play prominent roles within this group. These findings coincide harmoniously with teachers' opinions. Teachers stated in their statements that they attended these trainings with the aim of learning something new and improving their professional development. They also emphasized that, beyond participating in these trainings, an environment where social communication and interaction are at the forefront and where they can support each other, rather than a competition-oriented environment, increases their motivation.



5. DISCUSSION, PROPOSED MODEL, AND CONCLUSION

This section evaluates the opinions of teachers, mentors and experts about a gamified in-service training program and involves participating teachers and mentors coming together in a project and sharing their existing experiences. At the same time, this study examines the effect of the idea of digitalizing vocational training and transferring it to a gamified format on motivation and presents the results obtained.

In the study, the opinions of mentors and teachers on digital education were examined in detail and the wishes and needs of teachers were tried to be determined. Qualitative findings were evaluated based on literature studies on how gamification can be applied to e-learning environments. Additionally, in the quantitative dimension of the study, a survey was applied to determine the teachers' player types. In this way, the basis of the suggestion was supported, the target audience was better defined, and their preferences were revealed more clearly.

The results obtained showed that teachers and mentors showed a positive approach to gamification applications and experts made suggestions supporting the idea of gamification in education. In this context, as a result of the study, a module design prototype proposal that can be integrated into digital education platforms was presented, in line with the participants' opinions and the findings obtained.

5.1. Discussion

In this section, the findings obtained in line with the research questions are shared, supported by the determined themes. The results obtained as a result of the evaluation of the findings were compared with the similarities and differences in the literature.

RQ1: What are the participants' (teachers and mentors) views on the professional development processes carried out on the digital platform?

The opinions of the participants regarding the realization of professional development processes on digital platforms are quite diverse and dynamic. According to various sources in the literature, it is difficult to determine a general trend on this issue because the experiences, expectations and priorities of each participant differ.

Some teachers evaluate digital professional development processes positively due to the advantages offered by digital platforms, such as flexibility, accessibility, and easy access to learning materials. These participants think that digital platforms encourage learning independent of time and place, offer the opportunity to progress at their own pace, and are suitable for different learning styles (Johnson et al., 2014).

On the other hand, some teachers and mentors take a more conservative approach to digital professional development processes out of concern that they cannot replace face-to-face interaction. This group believe that it has become difficult to establish a more personal connection with students, that the digital environment brings with it some complexities, and that technical problems can reduce motivation (Garrison & Vaughan, 2008; Bates, 2019).

Moving these processes completely online is not a preferred situation, especially for some teachers. Some still insist on continuing the learning experience in a hybrid structure, not wanting to lose face-to-face interaction. However, the findings obtained from the observation notes and teacher interviews made throughout the project emphasize the advantages of teachers' desire to integrate the education process into their own life calendars and the ease of compensating for the disruptions experienced by the online environment. Additionally, when the mentors considered the project process more comprehensively, they pointed out the importance of developing digital training content in order to increase diversity in communication and interaction and meet individual needs.

Experts have made suggestions that individualization should come to the fore in digital education. In particular, they emphasized the necessity of developing learning content that can be identified with teachers, story-based, and integrated into daily life. (Bates, 2019; Johnson et al., 2014; Garrison & Vaughan, 2008).

RQ2: What are the participants' (teachers and mentors) views on the strengths and weaknesses of teacher education activities carried out on online platforms?

An important point emphasized by teachers and mentors during the research process is that digital education can find a more comfortable place in the busy daily life of teachers (Bates, 2019). This has the potential to offer teachers a more flexible, practical and economical learning experience.

Another point that stands out among the advantages offered by this digital education is that the researcher noticed while conducting a project with the participants that digital education makes transactions faster and easier. Its customization opportunities and suitability for planned work type allow teachers to use digital education effectively.

However, for some teachers, face-to-face education is preferred. This preference may be due to easier adaptation due to their habits or hesitation in using technological products. Although these situations are not generally of large proportions, they are noteworthy points.

The findings obtained from the research include teachers' opinions on the strengths and weaknesses of digital education and are categorized under two main headings, based on these opinions, as the "attributes" theme and the "context" theme (Figure 14).

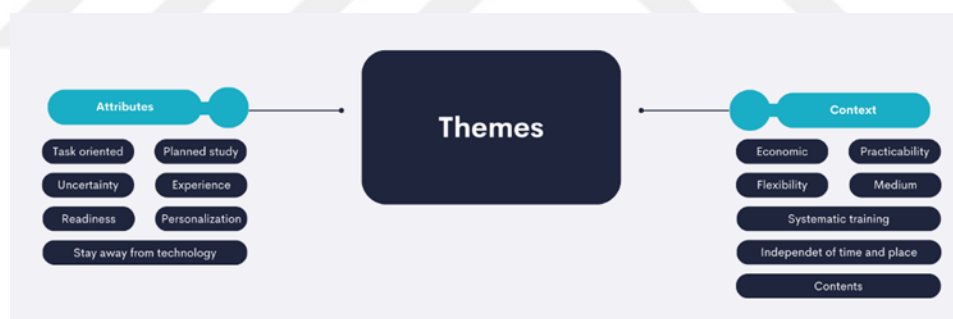


Figure 14. Scheme for transferring participants' professional development processes to online platforms

Evaluating the strengths and weaknesses in digital education, Bates's (2019) study highlights the advantages of teachers such as flexibility, personalization, and continuous learning opportunities, and also addresses weaknesses such as digital literacy difficulties and physical interaction limitations. Other sources in the literature also provide studies supporting these issues (Johnson et al., 2014; Siemens and Gasevic, 2012; Garrison & Vaughan, 2008).

In motivational aspects, Bates's (2019) work states that gamification and interactive learning methods increase teacher motivation. In addition, the flexibility and autonomy offered by digital platforms and the potential to increase teachers' motivation find support in the literature. On the other hand, Johnson et al.'s (2014) report warns that online education can limit personal connections and technical problems can lead to loss of motivation.

RQ3: How do the participants (teachers, mentors and experts) consider the influence of gamification on teacher education?

The findings obtained in this research aim to evaluate the effects of gamification for teacher education on the participants. In line with the answers received to the questions asked to the participants about how they evaluated the impact of gamification on teacher education, gamification dynamics, elements, mechanisms, and motivation categories, along with communication, interaction, and cooperation elements, were determined (Figure 15).

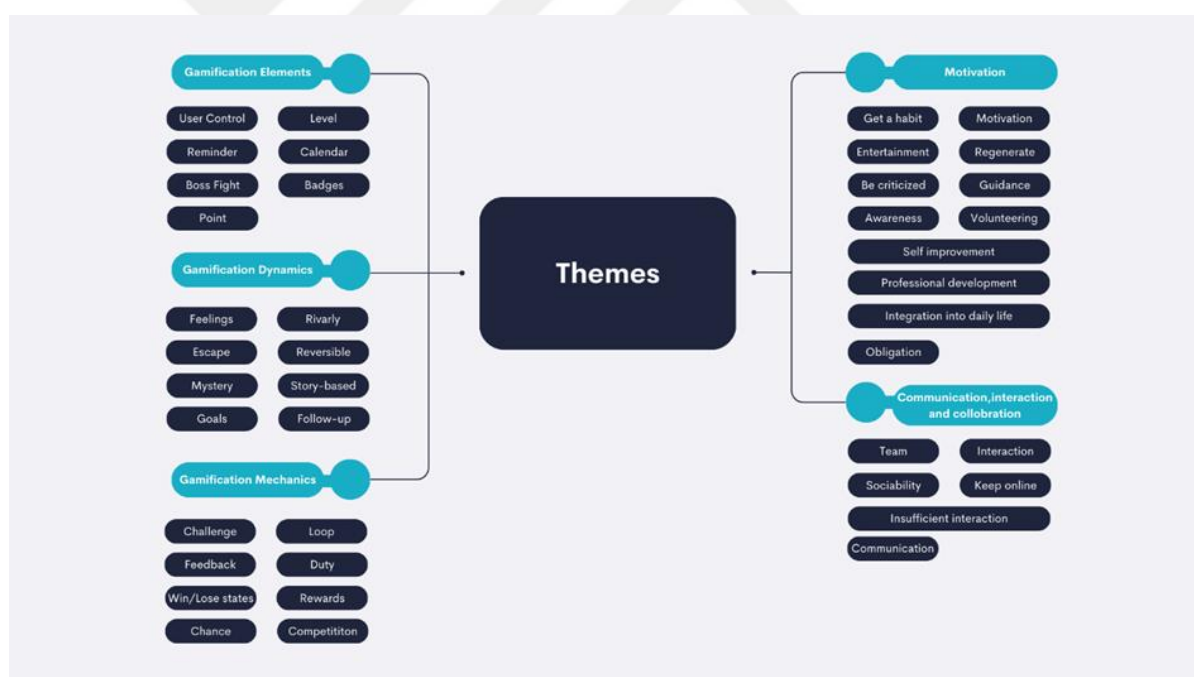


Figure 15. Diagram of participants' evaluation of the effect of gamification on teacher education

The elements of communication, interaction and collaboration evaluate the potential of gamification to increase communication and encourage collaboration and interaction between participants in teacher education. Gamification dynamics have

been examined to determine the emotional and motivational effects in teacher education. Gamification elements and mechanisms are focused on determining the details in teacher training. Finally, the category of motivation is important to understand what impact gamification in teacher education can have on participants.

In this context, participant evaluations will help us understand the effects of gamification on teacher education and develop more effective strategies.

3.1 How gamification may contribute to the interaction in teacher training?

Gamification stands out as an effective method, especially in the in-service training of teachers (Hamari et al., 2014; Deterding et al., 2011). In addition to providing teachers with an interactive learning environment, this method has the potential to motivate the learning process by making it more attractive and participatory. The basic elements of gamification are derived from games and have the ability to create an inherently interactive social environment. By using gamification in teachers' in-service training, it is possible to increase the interaction between teachers, enable them to internalize learning materials more effectively, and strengthen their pedagogical skills (Hamari et al., 2014; Deterding et al., 2011).

During the research process, the findings obtained from the interviews conducted within the scope of the BİSDEM project focus on the belief that the application of gamification in digital in-service training can provide a more interactive form. Participants within the scope of the project frequently complained about the lack of interaction, especially during the training process. The lack of interaction observed both on the platform and between teachers stems from their inability to interact with each other, their inability to support each other, and their inability to be sufficiently informed about each other from time to time. They stated that they felt lost because this situation caused teachers to not be able to experience the feeling of competition sufficiently and to compare themselves.

The opportunities offered by gamification in the digital in-service training process can offer solutions to teachers' lack of interaction and motivation problems. Gamification can strengthen collaboration between teachers and encourage interaction, helping to internalize learning materials more effectively. Additionally, feedback mechanisms and game elements that encourage competition on the platform can increase teachers' motivation by enabling them to participate more actively in the educational process

(Sailer et al., 2017). In this way, digital in-service training can become a more effective, interactive and motivating experience through gamification.

3.2 How gamification may contribute to motivation in teacher training?

Gamification methods stand out as an important issue in the education literature to increase teacher motivation. Findings from various sources, such as the studies of Hamari et al. (2014) and Deterding et al. (2011), provide strong support that gamification can strengthen teachers' motivation. This is further reinforced by teachers' opportunities to set their own professional and personal goals. Strategies such as educational competitions and teaching strategy sharing events can increase motivation by creating a competitive environment among teachers. The use of gamification tools can increase teachers' motivation by making their educational processes more fun and interactive. At the same time, this process can provide teachers with the opportunity to provide continuous feedback, encouraging them to see their success and make progress.

One of the important points emphasized in the expert interviews obtained during the research process is that feedback forms the basis of motivation. As stated with reference to the work of Werbach and Hunter (2012), feedback is effective tools that can create long-term commitment by increasing teachers' participation in the educational process. By diversifying these feedback mechanisms and adding visual elements such as scoring systems, badges, graphics, and leaderboards, it is possible to strengthen teachers' motivation and encourage them to be more actively involved in the education process. In this context, feedback-focused gamification strategies have the potential to create a lasting impact in education.

RQ4: How are participants' preferences for different game design elements affected by their player types?

There are literature findings indicating that player type identification surveys are an important factor that can affect participants' preferences for game design elements. For example, a study by Tondello et al. (2016) finds that player type identification surveys help individuals more accurately assess their disposition towards game elements. Research shows that different types of users may be more interested in or prefer certain types of game design elements.

For example, it has been stated that individuals with an achiever player type may find items such as rewards and achievements more attractive than others (Hamari, Koivisto, & Sarsa, 2014). In this context, it can be said that player type identification surveys can play an important role in creating personalized and effective gaming experiences by determining individuals' preferences on game design elements. However, research on this topic needs to be further deepened and more comprehensive studies need to be conducted to understand the reactions of different types of users to certain game elements.

An emerging theme among the key findings of the research is that teachers' individual differences play an important role. An effective tool that can be used to better understand these differences and discover common points is the player type determination survey, which aims to determine the general profiles of teachers. However, there is no study in the existing literature on the application of this type of survey on teachers.

According to the findings emerging during the interview process, the differences between teachers' perspectives on gamification-based learning and the diversity in their preferences when evaluating gamification were clearly seen. This reveals that there are significant differences in teachers' attitudes towards gamification depending on factors such as learning methods, student profiles and course content.

In this context, no studies on the player type determination survey of teachers mentioned in the literature have been found. This gap sheds light on future research to more deeply understand the relationship between teachers' learning preferences and perceptions of gamification.

RQ5: What kind of gamification system can be put forward to improve teacher training activities conducted on digital platforms?

The findings of the study were evaluated in line with the determined research question and a recommendation was made. In the current literature, there is no clear example of studies that identify and design a special module for the customized wishes and needs of teachers. This study provides a valuable suggestion to teachers that designing a specific module may be a useful approach.

5.2. Proposed Model

5.2.1. Gamified module

In line with the findings obtained during the research process, a prototype module was designed to meet the needs of teachers in educational environments. This prototype was created on the basis of Werbach and Hunter's (2012) D6 design framework.

This gamified module aims to motivate teachers and improve their educational experience. The data obtained from the research shaped the design of this module by focusing on the needs and wishes of teachers. Werbach and Hunter's (2012) D6 design framework contributed to the module creating an effective example of gamification by focusing on six basic design elements that support the interactive learning experience (Werbach & Hunter, 2012).

The user interface designs of the prototype were prepared in detail using an online design tool, Canva, to demonstrate a user-friendly interface to enable teachers using the module effectively. These designs contain elements that are visually appealing and aim to optimize the user experience.

This gamified module targets to increase teacher motivation by making the education processes of teachers more enjoyable and interactive. The prototype created in line with the findings and the design framework has the potential to offer teachers a more efficient and learning-oriented experience.

5.2.2. Proposed gamified module in line with Werbach and Hunter's D6 design framework

Werbach and Hunter's D6 Design Framework was chosen for the design of the gamified module. In this model, where the first letter of each step begins with D, the steps are implemented respectively as follows.

5.2.2.1. Define business objectives

To be integrated into a web platform, the module aims to offer interactive and entertaining experiences to teachers to ensure that users have a more motivated and

entertaining experience in digital in-service training processes. The following criteria were determined as business objectives.

- 1.1. Increase in Participation and Activity: It encourages teachers to use the platform actively by increasing their motivation for in-service training.
- 1.2. Competition and Cooperation: While encouraging competition, it also strengthens interaction between teachers by providing cooperation opportunities.
- 1.3. Personalized Progress Monitoring: The opportunity to monitor individual progress and receive customized feedback is provided.
- 1.4. Increased Motivation and Commitment: Strengthens each teacher's commitment to completing the module.
- 1.5. Instant Feedback Mechanism: The focus is on celebrating successes and helping them identify areas of development through instant feedback.

5.2.2.2. Delineate target behaviours

The behavioral changes targeted in teachers are as follows.

- 2.1. To increase the time teachers actively use the module and stay online on the platform.
- 2.2. Successfully complete tasks on the platform and interact with interactive elements.
- 2.3. To encourage competition and provide opportunities for collaboration in the module.
- 2.4. Responding to users' feedback received within the module and identifying areas for improvement.
- 2.5. Users achieve their own personal goals.

5.2.2.3. Describe your players

The module is designed to increase teacher motivation in online educational environments. Besides needs and wishes of teachers obtained through interviews, the

Gamification Player type Hexad survey developed by Marczewski (2015) was administered to the participant teachers. The survey results showed that teachers generally had achiever, philanthropist, free spirit, and socializer profiles, which indicated that teachers are individuals who are especially motivated by intrinsic motivation.

The most important criterion for the achiever profile is considered to be competence, which is associated with learning, personal development and skill acquisition. For the philanthropists' profile, purpose and search for meaning are prioritized. Free spirit profiles are associated with autonomy and creativity, and it has been observed that teachers in this profile place a special emphasis on the right to choice. The socializers, on the other hand, prioritize relatedness, social status, and social connections (Table 3). Deci and Ryan (2000) stated that the psychological foundations for teachers to reach their full potential are autonomy, competence, and relatedness.

5.2.2.4. Devise activity

The cycles determined for the module design were created in accordance with user needs. Progress in the module is directly proportional to the active participation of the user. The more active the user is, the more points one earns and the higher ranks on the leaderboards. Progress is visualized using gamification tools.

Activity loops are defined as recording and execution cycles. After the module is integrated into the website, the user is enabled to register to the module and use it interactively. Within the module, there is a menu consisting of five categories: "My Updates," "My Courses," "My Report," "Support" and "Expert Support."

This module is designed to suit the needs of the user and aims to optimize the user's interaction with the registration process and menu options within the module after integration into the website.

5.2.2.5. Don't Forget Fun!

The module prototype is designed to increase motivation and entertainment levels on educational web platforms. The main aim is to make the users' learning processes enjoyable.

Gamification elements are used as an effective strategy to increase motivation and fun in learning environments. These elements aim to make learning more impressive and enjoyable by providing students with more participation and interest in the learning process (Kapp, 2012).

5.2.2.6. Deploy the Appropriate Tools

This is an area that has not yet been fully explored. Since the module was developed as a prototype, the elements have not been determined to be suitable for all scenarios. In particular, gamification elements that were thought to best represent the points to be emphasized were preferred. In this context, elements such as gamification elements, badges, leaderboards, scoring, progress bars, skill charts and feedback prepared by Werbach and Hunter (2012) were thought to be appropriate. However, the module is designed to be open to development.

5.3. Gamified Module Design Prototype

The prototype of the module named "GamEduFlex" was prepared with UI designs on Canva. The login and registration pages in Figure 15 are specially designed for the module. The user is expected to register with information such as name, surname, e-mail address, branch, and password. In addition, he/she must use his/her e-mail address and password to log in to the module.

In this design, a control button is added to control the activity of the module. Additionally, a "Settings" button has been added to enable module settings. The "Settings" button provides an interface that allows the user to customize application or module behavior and set preferences. Through this button, users can have control over the way the module works, notification preferences and other features. These customization options allow users to tailor the module to their needs and manage their experience more effectively.

A standard login and registration screen is considered. Standardization on these screens allows the user to manage the process faster and easier. Krug (2014), a well-

known expert in the fields of UI and UX design, emphasizes in his book “Don't Make Me Think” how standardization in user interface design improves the user experience.

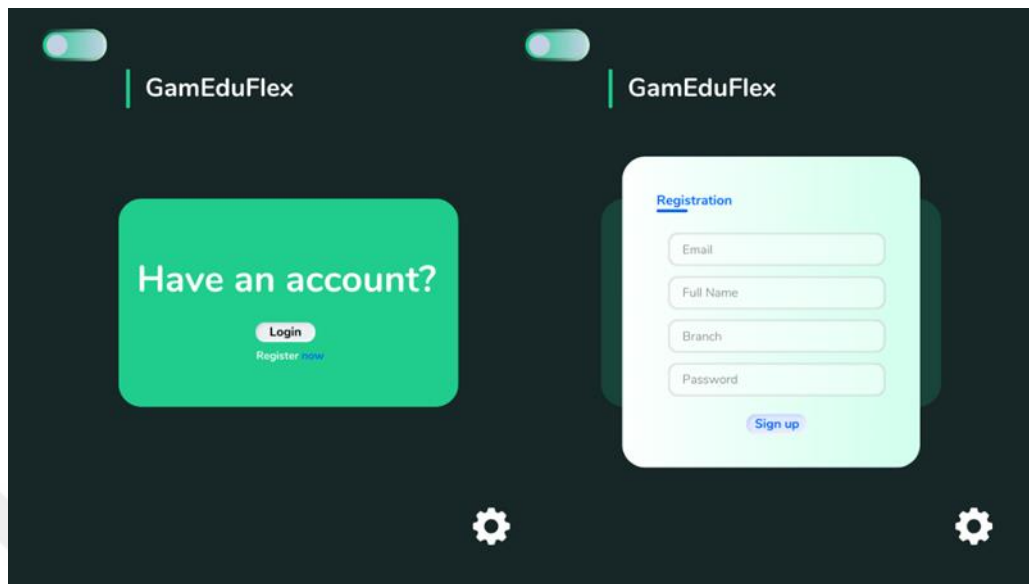


Figure 16. Login and registration page

The module feed screen in Figure 17 includes user information, settings, time counter, module activation button and a menu with 5 options. The design of this screen aims to provide users with quick access to their information and the opportunity to customize the module according to their preferences. With its user-friendly interface, this screen supports users to use the application interactively and efficiently.

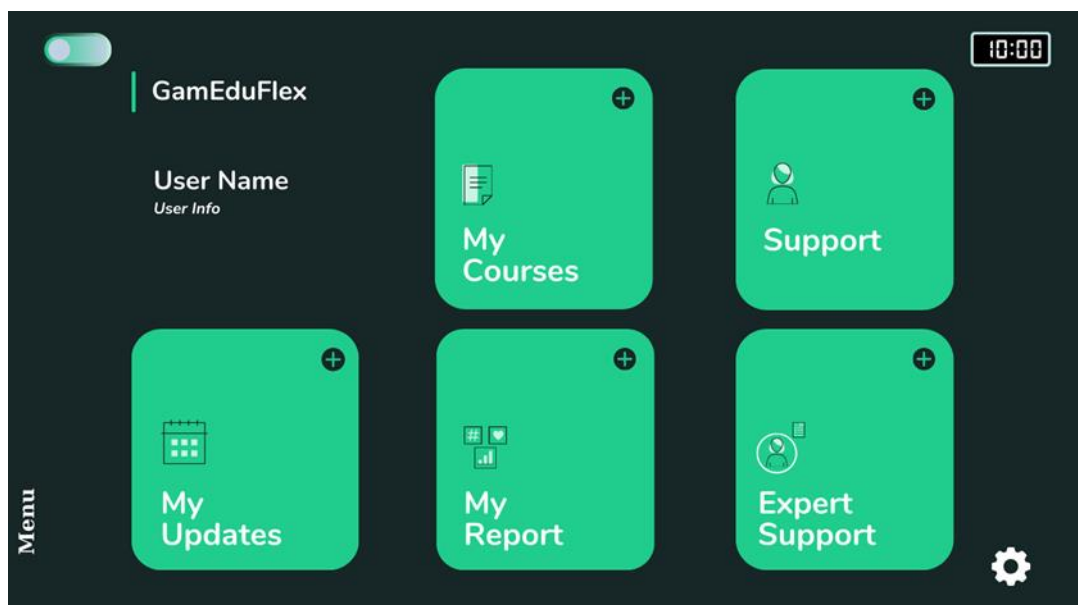


Figure 17. Feed

Time counter is an option that the user can customize from the module settings (Figure 18). The function of this button provides the user with the opportunity to manage the time spent in the application and raise awareness about this time. When making adjustments to the time counter, the user makes a commitment as to how many minutes he will actively use the module each day. For example, he might make a commitment to be active for ten minutes every day. The module provides support in achieving the goals specified by the user by sending reminder messages at specified times during the day via the user's registered e-mail address.

Motivation: Being active on a regular basis and making steady progress in the training integrated with the application are appropriate goals that enable the user to remain active with success and progress-oriented motivation.

Trigger: Gaining continuity in education, making studying a habit and creating a cycle.

Action: Choosing the appropriate time period using the time counter and working in a planned manner are the right steps that help the user organize his actions and create a plan to achieve his goals.

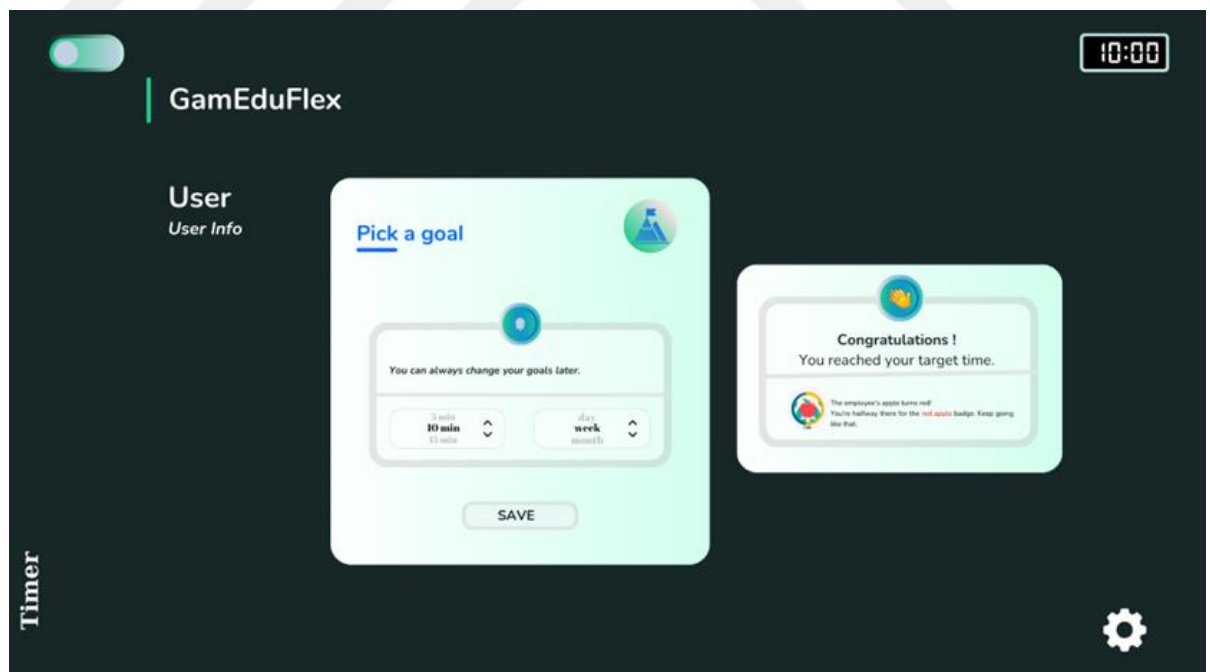


Figure 18. Time counter

In their book *Hooked: How to Build Habit-Forming Products* where they discussed user habits in product design, Eyal and Hoover (2015) explain, with the psychological principles and examples, how user-controlled loops can be established and how this has a positive effect by increasing the frequency of users' interaction with the product. Users can take on more responsibility to suit their own lives. This component aims to create a working cycle under the control of the user and develop habits.

According to the research findings, participants stated that being able to create their own plans was their first choice. In addition, it was stated that receiving reminders according to their own preferences made the participants feel more comfortable and prevented negative emotions caused by forgetting something in the rush of daily life or being overwhelmed by big promises. “Having guidance and reminders about which task to do and when makes it feel safe and provides comfort” (M4). While these results emphasize the autonomy of individuals in making and implementing their own plans, they indicate that the customizability of reminder systems is important in terms of motivation and comfort.

My Updates option in the menu in the feed is presented in detail in Figure 19. This section provides users with a calendar, allowing them to organize their tasks and add reminders to these tasks. Tasks completed by users are automatically marked. On the same calendar, badges and awards that the user has earned at the same time are displayed. Users can also see the reward they will earn for the last step of a mission; This step symbolizes the completion stage of the task. The management tool located next to the calendar allows users to choose calendar editing tools. To add tasks, users use the "+" button in the lower right corner.

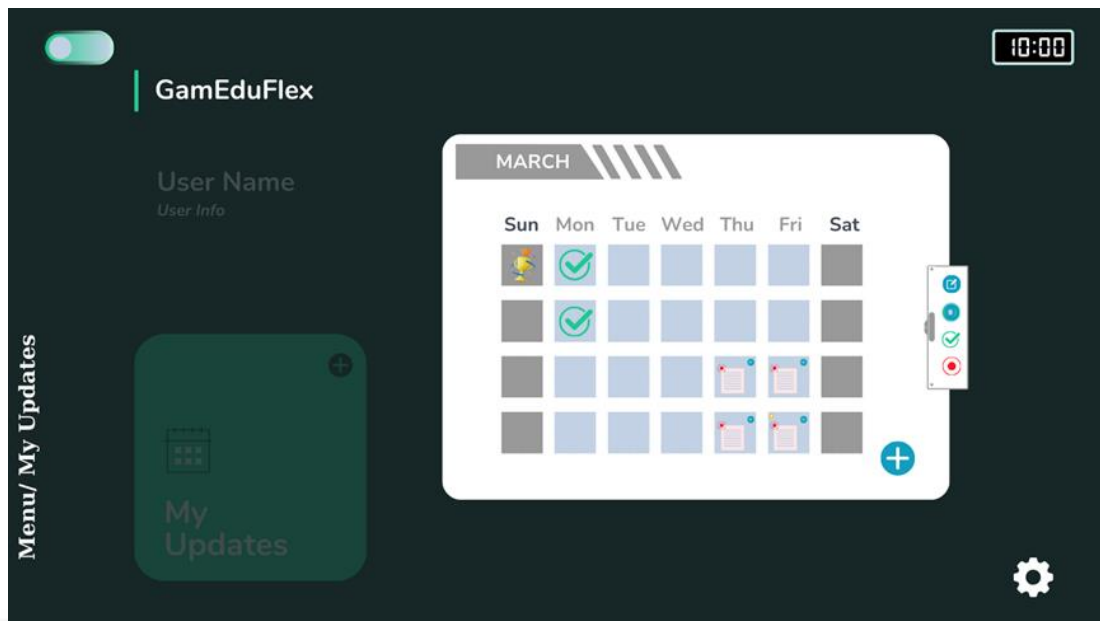


Figure 19. My updates

In My Courses section of the feed, there is a video watching scenario planned based on the user's task on the website (Figure, 20). While watching the videos, the user will also have a notes area where he can take notes at certain minute intervals. In this way, he will be able to record which notes he took for which minute interval and download this information to his computer if he wishes.

Additionally, in the video viewing scenario, the teacher will have a progress bar where he can see which part of the course he is in and how much time is left. In this way, the teacher will be able to follow his progress, and users who happily expressed this during the interviews said, "Frankly, I would like to see my own progress." They stated it as (G1).

Conrad, Couper, Tourangeau, and Peytchev (2010) conducted an experimental study in which they examined the effect of the speed of task completion or progress indicators in user interfaces on task completion rates. This research concludes that the design and use of progress indicators can play an important role in user motivation and task completion.

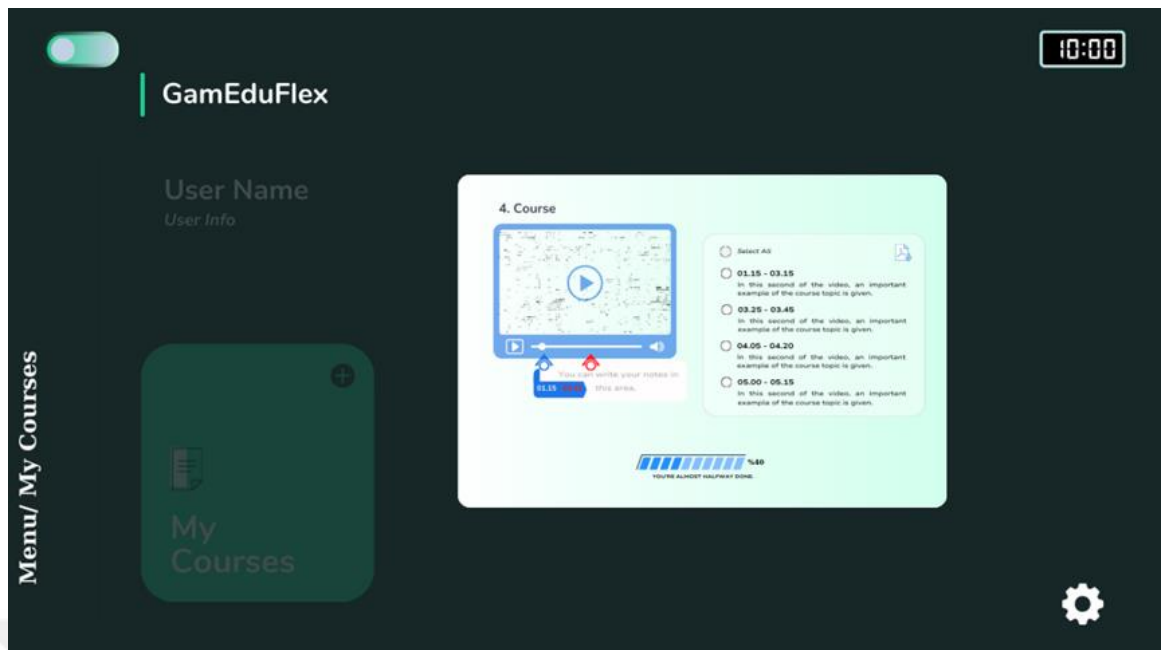


Figure 20. My courses

Another component included in My Courses section is the collaboration option. This option is intended to provide concurrent study for users trying to complete the same course at the same time. If users are working simultaneously, a notification screen is displayed to send notifications to other users, as visualized in Figure 21. The user can optionally view other users online, send requests to them, and support each other by creating a shared notebook. It is thought that this approach will motivate users and support the process by completing one task at a time. During the interviews, the participants (G1) said, "I think it would be nice for us if we could reach our other friends and exchange ideas. We just made our additions and completed our task." And they emphasized the inadequacy of interaction between users.

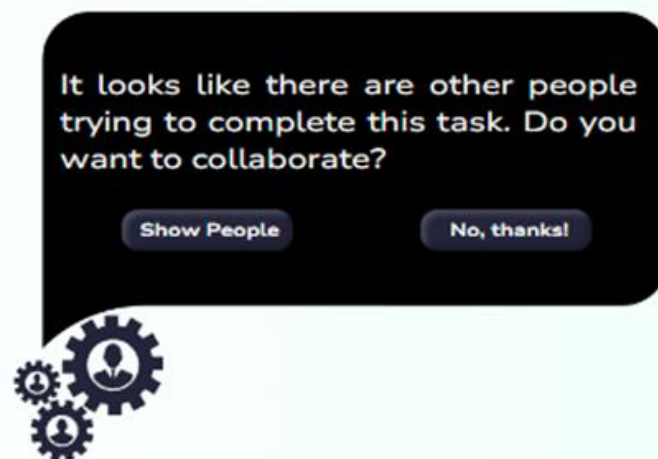


Figure 21. Collaboration request

The Support section is a structure that aims to increase interaction and communication between teachers (Figure 22). In this section, teachers can open topics on the topics they need and share their posts with other users of the module. All users can comment on these posts and offer solutions to each other's problems based on their own experiences. The post with the most comments is highlighted in the "Trending Post" section and featured on this page. This way, it is made easily accessible to users.

Discussion forums, which stand out especially in online learning processes, are a learning tool frequently preferred by instructors to encourage interaction and complex thinking (Kilinc & Altınpulluk, 2021). Therefore, it aims to provide discussion opportunities by creating an interactive environment within this module.

Based on the opinions of the participants, their preference to interact more with each other stems from their belief that they will be better understood, especially with their colleagues who are going through similar processes. According to mentor opinions, "If teachers were in more communication with each other, they could benefit from each other's experiences and provide more effective support to each other" (M3). In this context, it is thought that supporting each other can increase teachers' learning outcomes.

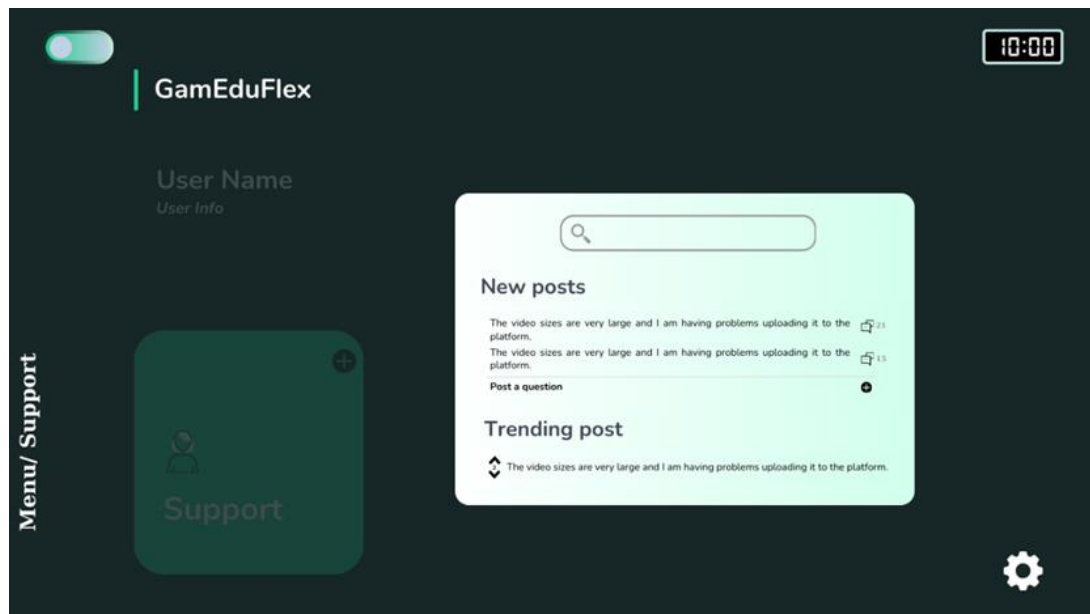


Figure 22. Support

Expert Support includes voluntary mentoring services (Figure 23). Special mentor profiles are created for individuals who successfully prove their mentoring abilities during registration. These mentors can create postings in the Expert Support section according to their availability. They indicate the date and time ranges they have determined. When teachers request mentor support, they access this section where they can see the availability of volunteer mentors, choose the mentor that suits them best and make an appointment. If the mentor accepts the appointment, the meeting will take place on the specified date; If they do not accept, they can choose another mentor. Teachers can rate and evaluate mentors following interviews with their mentors; They can also mark mentors as favorites to schedule more meetings. This way, other teachers can also learn about the mentor.

Expert opinion and feedback are of great importance in terms of guidance for teachers. A teacher's opinion on this subject included the following statement: "When someone who is competent observes my work and gives positive and detailed feedback, it motivates me and makes me more curious." (G2).

In addition to the opinions, Crawford (2007) also emphasizes the positive contribution of qualified mentor guidance to the educational processes of teachers; Feedback for teachers supports continuous learning and aims for professional development. At the same time, this process, which provides teachers with personal development

opportunities in certain skills and areas of expertise, shows that expert feedback is an effective factor in teachers' continuous improvement (Lee & Johnson, 2018).

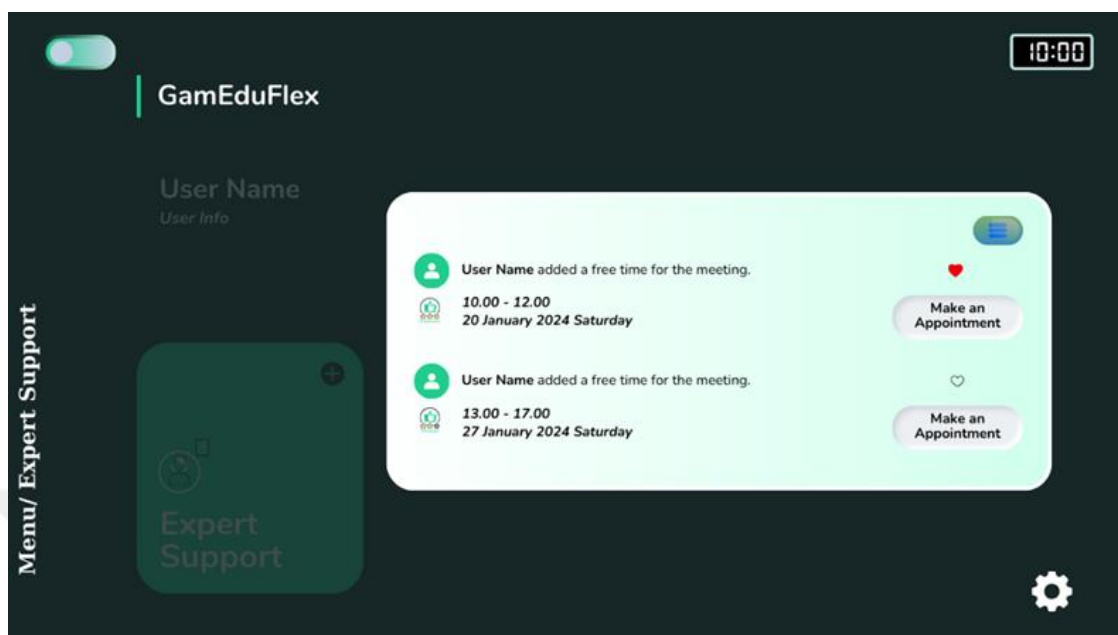


Figure 23. Expert support

My Report area contains reports and tables showing the user's progress regarding the entire process, badges he/she has earned and progressed to earn, and where the rankings of users relative to each other are reflected with gamification elements (see Figure 24). These badges, ratings, rankings, and metrics for grading skills are the area where the module combines motivation with entertainment.

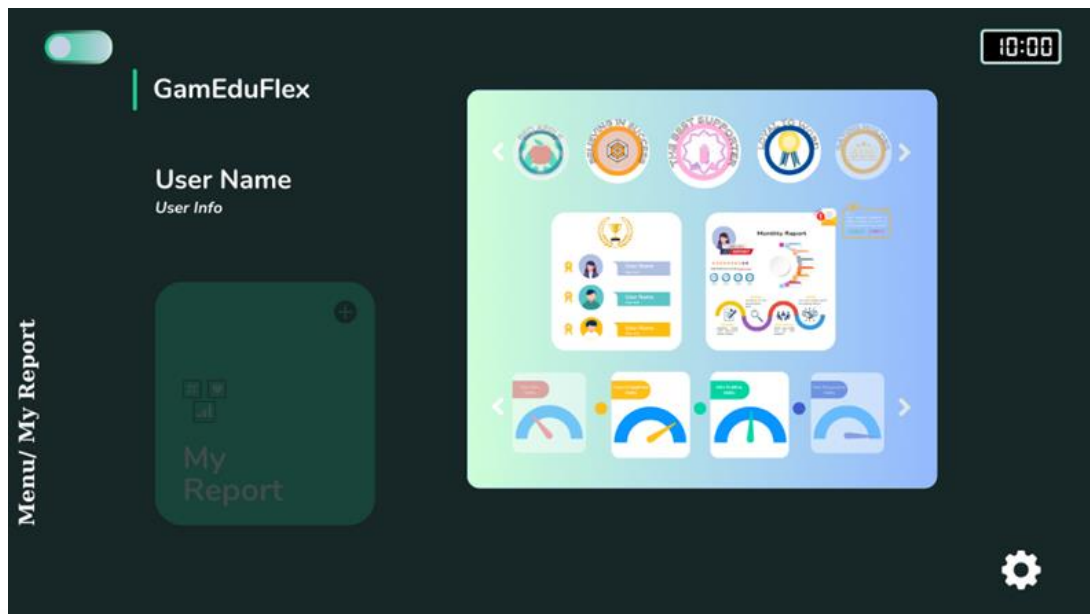


Figure 24. My report

For example, giving a "The Best Supporter" badge to the teacher who commented on the posts of 5 teachers in the teacher "Support" field, and giving a "Loyal to Word" badge to the person who worked for 3 weeks as promised (Figure 25).



Figure 25. My report - badges

Teachers need to determine their position by comparing their performance with other colleagues. When making this comparison, it is possible to integrate leaderboards that measure performance metrics (Figure 26). This component strengthens the competitive side of some teachers (Hanus & Fox, 2015). Competition is one of the important elements that increase the motivation of the participant. However, it is recommended to determine performance metrics that evaluate success so that the leaderboards do not appear overly competitive. These metrics should cover teachers' performance in areas such as student achievement, level of engagement, student feedback, and collaboration with colleagues.

The leaderboard planned in this module will mainly aim to provide feedback to users about their status but will not prioritize competition. When creating the leaderboard, it is planned to share all metrics in a way that users can easily see. An expert opinion supporting this is also among the findings. “It has to be more than just the leaderboard. Feedback is one of the important elements for training. The most important part of gamification should be feedback, and we should focus more on what we can give as feedback.” (U1) Gamification elements can motivate the user; However, in order for these elements to become habits and be effective in the long term, the teaching must be planned in a more nurturing way.

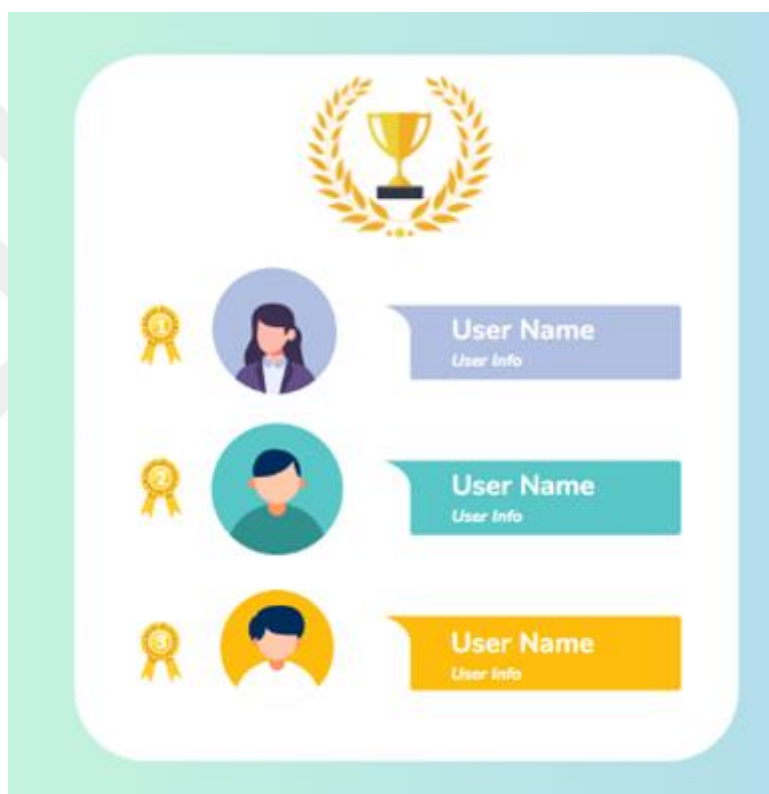


Figure 26. My report – badges

Likewise, it is planned to evaluate teachers monthly in order to reflect the reporting in more detail. This evaluation will be carried out through the activities and activities on the module, and the obtained data will be visualized with graphics (Figure 27). In this way, the user will be able to track both his own status and where he is compared to other users. The planned evaluation system will score and reward stars according to the user's success within a month. In addition, the user will be able to see which title he/she has earned and optionally have the entire report sent to his/her e-mail address.



Figure 27. My report – feedback

5.4. Limitations

In interpreting the findings obtained from this research, it is recommended to take into account some limitations in the research process. The research was conducted as a participant in the Design and Evaluation of the Effectiveness of the Scientific Inquiry Supported Online Mentoring (e-Scaffolding) Model in In-Service Teacher Education (BİSDEM) project coded 220K080, supported by TÜBİTAK within the scope of the Scientific and Technological Research Projects Support Program (1001) in the 2021-2022 academic year. It is limited to 20 teachers, 10 classroom teachers and 10 science teachers, and six mentor faculty members working in the same project. The teachers in the study group of the research did not take part in any gamification-related activities within the scope of the project, and their exposure to games, gamification or game-

based learning during their professional lives was limited. It is possible that this limitation created a novelty effect on the participating teachers regarding the processes within the scope of the research.

Although the teachers were informed about gamification before the interview, the researcher's experience during the interview was that this information was insufficient. As a matter of fact, it has been observed that conceptual confusion has arisen between the concepts of game, game-based learning and gamification. As a matter of fact, teachers first approached the interview questions about games or gamification from the perspective of their students in the classes they taught, rather than as a learner receiving in-service training. In this context, it was noteworthy that the teachers reflected their own perspectives during the interviews, often by giving examples based on their students. They updated their answers in line with the researcher's guidance, but the fact that the teachers only experienced the game for entertainment purposes in their individual lives affected their perceptions of how to use gamification as a professional tool.

The second important limitation of the research is that the module modeled and designed within the scope of the research has not been implemented and tested. The design that emerged as a result of the research is a generic design that can be used on different digital platforms and learning management systems. Although this design, modeled in accordance with the gamification principles expressed in the literature and the opinions and experiences of the learners, can be adapted to different platforms by developers, the fact that the design has not been implemented and tested should be considered as a limitation of this research.

These factors limit the generalizability of the results of the study and need to be taken into account in interpreting the findings and results of the study.

5.5. Conclusion

This research aimed to determine the motivational needs of teachers by analyzing their experience in online in-service training, and to propose a more impressive and entertaining training module with the gamification method. The wishes and needs of teachers in digital in-service trainings were examined in detail with the findings

obtained from different participant groups, and important results were obtained within this framework. The findings highlight teachers' attitudes towards gamification of professional development programs and the advantages and disadvantages of applying gamification to educational environments for teachers.

The most obvious advantages of applying gamification to online environments for teachers include factors such as flexibility, creating an environment where communication and interaction are high, and making the learning process fun. In addition, gamified professional development programs have been shown to be effective in establishing habits and ensuring continuity. However, some teachers have expressed concerns that gamification simply makes the learning process a game rather than gamifying it. In addition, problems such as increased screen time and the risk of addictions may also arise. In addition, due to teachers' limited familiarity with digital processes, there may be some difficulties in technical infrastructure and technological tools.

The findings obtained in this research focused on the needs of teachers regarding the gamification of their professional development. Interviews with teachers within the scope of the research revealed that they need an education model that will make them feel more productive in their daily lives and at the same time make them feel closer to the educational process. It was thought that gamification could offer a positive solution to this need, and teachers were seen to be positive about this idea.

Teachers' readiness with technology contributes to them seeing education in digital environments as an opportunity. The opportunity to have easier access to their own education online in busy living conditions causes teachers to have a positive attitude towards digital in-service training. It is thought that gamification can make this positive attitude more effective and it is emphasized that teachers can be motivated in this direction.

In the literature, no studies have been found that would provide a direct framework for the gamification of teachers' digital in-service training. This research offers a new perspective to the literature by filling a gap in this field. Although there are examples of gamification in online learning environments in many sectors and education, the need to know the user well in order to make learning permanent stands out. This

research has made a significant contribution in this context by presenting teacher demands and needs from different perspectives.

As a result of the research, a module design proposal was presented for the motivational needs of teachers. This recommendation is a direct reflection of the findings and represents an educational model that can respond more effectively to teachers' needs. This design proposal creates a basis that can guide and improve future studies.

As a result, this research has brought a new perspective to the literature by thoroughly examining teachers' demands and needs regarding the gamification of in-service training in digital environments. The findings provide an important basis for teachers to take a more positive approach to digital in-service training and to evaluate the potential advantages of gamification in this process. This research provides important clues for researchers and educators who are looking for new methods in education.

REFERENCES

- Alagöz Hamzaj, Y. (2022). *Öğretmenlere yönelik mesleki öğrenme modeli geliştirilmesi ve modelin eğitimde oyunlaştırma konusunda uygulanması* (722959) [Doktora tezi, Eğitim Bilimleri Enstitüsü, Anadolu Üniversitesi]. YÖK Tez Merkezi.
- Alioon, Y. (2016). *An Investigation of student engagement, motivation and attitudes towards course content in a mobile-learning enhanced course*. [Yayınlanmamış yüksek lisans tezi, Orta Doğu Teknik Üniversitesi]. YÖK Tez Merkezi.
- AlMarshedi, A., Wills, G., Wanick, V., & Ranchhod, A. (2015). SGI: A framework for increasing the sustainability of gamification impact.
- Anderson, T. (2008). Towards a theory of online learning. *Techtrends: Linking Research & Practice to Improve Learning*, 52(1), 53-60.
- Arabacıoğlu, S., Ünver, A. O., Şenler, B., Okulu, H. Z., Yılmaz, Y. Ö., & Muslu, N. (2022). Sınıflarda video kaydı hazır bulunuşluk ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışması. *Eğitim Teknolojisi Kuram ve Uygulama*, 12(2), 328-350. doi: <https://doi.org/10.17943/etku.1013535>
- Ar, N. A. (2016). *Oyunlaştırmayla öğrenmenin meslek lisesi öğrencilerinin akademik başarı ve öğrenme stratejileri kullanımı üzerine etkisi*. [Yayınlanmamış yüksek lisans tezi, Sakarya Üniversitesi]. YÖK Tez Merkezi.
- Ar, N. A., & Akgün. Ö. E. (2014, Haziran 12). *Öğretim sistemlerinin değerlendirilmesi için: Oyunlaştırma ilkeleri ölçeği* [Tam metin bildirisi]. III. Sakarya'da Eğitim Araştırmaları Kongresi, Sakarya Üniversitesi, Sakarya, Türkiye. Retrieved from <https://acikerisim.sakarya.edu.tr/handle/20.500.12619/94888>
- Aşıksoy, G. (2018). The effects of the gamified flipped classroom environment (GFCE) on students' motivation, learning achievements and perception in a physics course. *Quality & Quantity*, 52(1), 129-145.

- Azadegan, A., Riedel, J. C., & Hauge, J. B. (2012, September 26-29). *Serious games adoption in corporate training* [Conference Paper]. Third International Conference, SGDA, Bremen, Germany. doi: https://doi.org/10.1007/978-3-642-33687-4_6.
- Bakkes, S., Tan, C. T., & Pisan, Y. (2012, July 21). *Personalised gaming: a motivation and overview of literature* [Conference Paper]. 8th Australasian Conference on Interactive Entertainment: Playing the System, Auckland, New Zealand.
- Banfield, J., & Wilkerson, B. (2014). Increasing student intrinsic motivation and self-efficacy through gamification pedagogy. *Contemporary Issues in Education Research (CIER)*, 7(4), 291-298.
- Bartle, R. (1996). Hearts, clubs, diamonds, spades: Players who suit MUDs. *Journal of MUD research*, 1(1), 1-27.
- Bates, A. W. (2019). *Teaching in a digital age: Guidelines for designing teaching and learning*. BC Campus.
- Benson, B. K. (1997). Coming to terms: Scaffolding. *The English Journal*, 86(7), 126-127.
- Bolat, Y. İ., Şimşek, Ö., & Ülker, Ü. (2017). Oyunlaştırılmış çevrimiçi sınıf yanıtlama sisteminin akademik başarıya etkisi ve sisteme yönelik görüşler. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi*, 17(4), 1741-1761. doi: 10.17240/aibuefd.2017.17.32772-363964
- Bozkurt, A., & Genç Kumtepe, E. (2014, Şubat 5). *Oyunlaştırma, oyun felsefesi ve eğitim: Gamification* [Bildiri]. Akademik Bilişim Kongresi, Mersin, Turkey.
- Bryman, A. (2012). *Social research methods*. Oxford University Press.
- Brigham, T. J. (2015). An introduction to gamification: Adding game elements for engagement. *Medical Reference Services Quarterly*, 34(4), 471-480.
- Bozyer, Ö., & Bağcı, Ö. A. (2018, December 4). *Eğitimde oyunlaştırma örnekleri* [Bildiri]. ICPESS 2018. Nevşehir, Cappadocia, TURKEY.
- Brown, J. (2019). Integrating Digital skills gained in online education into everyday life. *Journal of Online Learning Research*, 5(2), 127-141.
- Brown, R. (2021). *Engaging with the field: A guide to participant observation*. Sage Publications.
- Buckley, P., & Doyle, E. (2016). Gamification and student motivation. *Interactive*

- Learning Environments*, 24(6), 1162-1175.
- Bunchball, A. (2010). *Gamification 101: An introduction to the use of game mechanics to influence behavior*. Retrieved from <http://www.bunchball.com/sites/default/files/downloads/gamification101.pdf>
- Busch, M., Mattheiss, E., Orji, R., Marczewski, A., Hochleitner, W., Lankes, M., ... & Tscheligi, M. (2015, October 5). *Personalization in serious and persuasive games and gamified interactions* [Conference paper]. 2015 Annual Symposium on Computer-Human Interaction in Play, London, United Kingdom.
- Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2018). *Eğitimde bilimsel araştırma yöntemleri* (25. Baskı). Pegem Akademi.
- Caillois, R. (2001). *Man, play, and games*. University of Illinois Press.
- Cassells, T., Broin, D. O., & Power, K. (2015, October 8). *Increasing student engagement with gamification* [Conference paper]. European Conference on Games Based Learning. Nord-Trondelag University College Steinkjer, Norway.
- Chou, Y. K., (2013). *Octalysis -complete Gamification framework*. Yu-kai Chou: Gamification & Behavioral Design [Online]. Retrieved from <https://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/> ,17.10.2022
- Chou, Y. K. (2015). *Actionable gamification: Beyond points, badges, and leaderboards*. Packt Publishing Ltd.
- Chou, Y. K. (2019). *Actionable gamification: Beyond points, badges, and leaderboards*. Packt Publishing Ltd.
- Classcraft*. (2024, January, 01). Retrieved from <https://www.classcraft.com/>.
- ClassDojo*. (2024, January, 01). Retrieved from <https://www.classdojo.com/tr-tr/?redirect=true>.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). Routledge.
- Collins, A. (1992). Towards a design science of education. In E. Scanlon ve T. O'Shea (Eds.), *New directions in educational technology* (pp. 15–22). Springer.
- Collins, A. (1999). The changing infrastructure of education research. In E.C.

- Lagemann & L.S. Shulman (Eds.), *Issues in education research: Problems and possibilities* (pp. 289–298). Jossey-Bass Publishers.
- Conrad, F. G., Couper, M. P., Tourangeau, R., & Peytchev, A. (2010). The impact of progress indicators on task completion. *Interact Comput.*, 22(5), 417–427. doi:10.1016/j.intcom.2010.03.001.
- Crawford, B. A. (2007). Learning to teach science as inquiry in the rough and tumble of practice. *Journal of Research in Science Teaching*, 44(4), 613–642.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research*. Sage publications.
- Çağlar, Ş., & Arkün-Kocadere, S. (2015). Çevrimiçi öğrenme ortamlarında oyunlaştırma. *Eğitim Bilimleri ve Uygulama*, 14(27), 83-102.
- De-Marcos, L., Domínguez, A., Saenz-de-Navarrete, J., & Pagés, C. (2014). An empirical study comparing gamification and social networking on e-learning. *Computers & Education*, 75, 82-91.
- Dempsey, J., Haynes, L., Lucassen, B., & Casey, M. (2002). Forty simple computer games and what they could mean to educators. *Simulation & Gaming*, 33(2), 157-168.
- Deterding, S. (2012). Gamification: designing for motivation. *Interactions*, 19(4), 14-17.
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September 28). *From game design elements to gamefulness: defining "gamification"* [Conference paper]. 15th International Academic MindTrek Conference: Envisioning Future Media Environments, Tampere, Finland.
- Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011, May 7). *Gamification. using game-design elements in non-gaming contexts* [Conference paper]. CHI: Conference on Human Factors in Computing Systems, Vancouver BC, Canada. (pp. 2425-2428).

- Diamond, L., Tondello, G. F., Marczewski, A., Nacke, L. E., & Tscheligi, M. (2015, October 5). *The HEXAD gamification user types questionnaire: Background and development process*. CHI PLAY 2015-The ACM SIGCHI Annual Symposium on Computer-Human Interaction in Play, London United Kingdom.
- Dominguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernandez-Sanz, L., Pages, C., & Martinez-Herraiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63, 380-392.
- Duolingo. (2024, January, 01). Retrieved from <https://www.duolingo.com/>
- Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Sage Publishing.
- Eyal, N. ve Hoover, R. (2015). *Kancaya takılınca: Alışkanlık yaratan ürünler geliştirmenin sırları*. (çev. B. Akat). Elma Yayınevi.
- Fiş Erümit, S. (2016). *Oyunlaştırma yaklaşımlarının eğitimde kullanımı: Tasarım tabanlı bir araştırma* (Tez No: 442994) [Yüksek Lisans Tezi, Atatürk Üniversitesi]. YÖK Tez Merkezi
- Fitz-Walter, Z., Johnson, D., Wyeth, P., Tjondronegoro, D., & Scott-Parker, B. (2017). Driven to drive? Investigating the effect of gamification on learner driver behavior, perceived motivation and user experience. *Computers in Human Behavior*, 71, 586- 595. doi: 10.1016/j.chb.2016.08.050
- Fogg, B. J. (2009, April 26). *A behavior model for persuasive design*. 4th international Conference on Persuasive Technology, Claremont California, USA.
- Fraenkel, J. R., & Wallen, N. E. (2005). *How to design and evaluate research in education* (6th ed.). McGraw-Hill.
- Fraenkel R. J., & Wallen E. N. (2006) *How to design and evaluate research in education*. McGraw-Hill.
- Fraenkel, J., Wallen, N., & Hyun, H. (2018). *How to design and evaluate research in education* (10th ed.). McGraw-Hill.
- Freeman, D. & Anderson, M. (2011). *Teaching and principles in language teaching*. Oxford University Press. Oxford
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in

- science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410-8415.
- Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.
- Gay, L. R., Mills, G. E., & Airasian, P. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson Education.
- Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment (CIE)*, 1(1), 20-20.
- Gee, J. P. (2007). *What video games have to teach us about learning and literacy*. Macmillan.
- Gee, J. P. (2008) Learning and games. In K. Salen. (Eds.), *The ecology of games: Connecting youth, games, and learning*. The MIT Press, doi: 10.1162/dmal.9780262693646.021
- Gee, J. P. (2013). *Good video games and good learning: Collected essays on video games, learning, and literacy*. Peter Lang.
- Glover, I. (2013, June 24). Play as you learn: Gamification as a technique for motivating learners [Conference paper]. EdMedia 2013 World Conference on Educational Media and Technology Sheffield, Hallam University, United Kingdom.
- Gökkaya, Z. (2014). A new approach in adult education: gamification. *Hasan Âli Yücel Journal of Faculty of Education*, 11(1), 71-84.
- Grace, M. V., & Hall, J. (2008). *Projecting Surveillance Entertainment*. Presentation, ETech, CA, San Diego.
- Greene, J. C., & Caracelli, V. J. (Eds.), (1997). *Advances in mixed-method evaluation: The challenges and benefits of integrating diverse paradigms*. San Francisco: Jossey-Bass.
- Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching*, 8(3), 381-391.
- Güler, E. (2015). Mobil sağlık hizmetlerinde oyunlaştırma. *Açık Öğretim Uygulamaları ve Araştırmaları Dergisi*, 1(2), 82-101.
- Gündüz, A. Y. (2020). *Dönüştürülmüş öğrenmenin çevrimiçi boyutunu oyunlaştırmanın öğretmen adaylarının öğrenme yaşantılarına etkisi* (Tez No: 617944) [Doktora Tezi, Hacettepe Üniversitesi, Eğitim Bilimleri Enstitüsü].

YÖK Tez.

- Gürbüz, S., & Şahin, F. (2018). *Research in social sciences philosophy method analysis*. Seçkin Publishing.
- Habgood, M. P. J. (2007). *The effective integration of digital games and learning content* (U237300) [Doctoral thesis, University of Nottingham]. ProQuest Dissertations Publishing.
- Hamari, J., (2013). Transforming homo economicus into homo ludens: A field experiment on gamification in a utilitarian peer-to-peer trading service. *Electronic Commerce Research and Applications*, 12(4), pp. 236-245.
- Hamari, J., Koivisto, J., & Sarsa, H. (2014, January 6). Does gamification work? A literature review of empirical studies on gamification [Conference paper]. System Sciences (HICSS), 47th Hawaii International Conference, Waikoloa, HI, USA.
- Hamari, J., & Tuunanen, J. (2014). Player types: A meta-synthesis. *Transactions of the Digital Games Research Association*, 1(2), 29-53. doi: <https://doi.org/10.26503/todigra.v1i2.13>
- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & education*, 80, 152-161. doi: 10.1016/j.compedu.2014.08.019
- Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
- Hong, G. Y., & Masood, M. (2014). Effects of gamification on lower secondary school students' motivation and engagement. *International Journal of Social, Education, Economics and Management Engineering*, 8(12), 3483-3490.
- Hoon, K., Park, J., Yul, K. D., Moon, H. L., & Chun, H. C. (2002). E-lifestyle and motives to use online games. *Iris Marketing Review*, 15(2), 71-72.
- Huang, B., Hew, K. F., & Lo, C. K. (2018). Investigating the effects of gamification-enhanced flipped learning on undergraduate students' behavioral and cognitive engagement. *Interactive Learning Environments*, 27(8), 1106-1126.
- Huang, W. H. Y., & Soman, D. (2013). Gamification of education. *Report Series: Behavioural Economics in Action*, 29(4), 37.

- Huizinga, J. (1980). *Homo ludens: A study of the play-element in culture* (2nd ed.). Routledge & Kegan Paul.
- İşman, A. (2022). *Uzaktan eğitim: Eğitim bilimleri*. (5. Baskı). Pegem Akademi. ISBN: 978-975-8792-82-2
- Johnson, L., Becker, S., Estrada, V., & Freeman, A. (2014). *2014 Higher Education Edition*. The New Media Consortium. Retrieved from <http://cdn.nmc.org/media/2014-nmc-horizon-report-he-EN-SC.pdf>
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.
- Johnson, S. A., & Brown, E. (2019). Enhancing learning experiences through gamification: A systematic review. *Journal of Interactive Learning Research*, 30(4), 519–534.
- Jo, J., Jun, H., & Lim, H. (2018). A comparative study on gamification of the flipped classroom in engineering education to enhance the effects of learning. *Computer Applications in Engineering Education*, 26(5), 1626-1640.
- Jones, M. (2020a). Gamification in education: motivation and learning. *Educational Technology & Society*, 23(3), 284–297. <https://www.jstor.org/stable/26856251>
- Jones, M. (2020b). *The art of effective observation*. Cambridge University Press.
- Kahoot study. (2024, January, 01). Retrieved from <https://kahoot.com/kahoot-study/>.
- Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. John Wiley & Sons.
- Kaptein, M., Markopoulos, P., De Ruyter, B., & Aarts, E. (2015). Personalizing persuasive technologies: Explicit and implicit personalization using persuasion profiles. *International Journal of Human-Computer Studies*, 77, 38-51.
- Karabacak, Ö. (2018). *Examining the effect of a gamified environment on students' academic motivation and self-efficacy for english*. (Tez No: 524566) [Yüksek Lisans Tezi, Bahçeşehir Üniversitesi, Eğitim Bilimleri Enstitüsü]. YÖK Tez Merkezi.
- Karataş, E. (2014). Eğitimde oyunlaştırma: Araştırma eğilimleri. *Journal of Kirsehir Education Faculty*, 15(2), 315-333.
- Keskin, A. (2009). *The effect of games on the development of multiple intelligence*

- areas of children*. [Unpublished Master's Thesis, Selcuk University, Institute of Social Sciences], YÖK Tez.
- Kilinc, H., & Altınpulluk, H. (2021, February 19). *Use of discussion forums in online learning environments* [Conference paper]. 2nd World Conference on Teaching and Education, Vienna, Austria. doi:10.33422/ijhep.v2i1.25
- Kim, E., Rothrock, L., & Freivalds, A. (2018). An empirical study on the impact of lab gamification on engineering students' satisfaction and learning. *International Journal of Engineering Education*, 34(1), 201-216.
- Kirk, J., Miller, M. L., & Miller, M. L. (1986). *Reliability and validity in qualitative research*. SAGE.
- Kirriemuir, J., & McFarlane, A. (2004). *Literature review in games and learning*. HAL Open Science.
- Kitzinger, J., & Farquhar, C. (1999). The analytical potential of 'sensitive moments' in focus group discussions. In R. S. Barbour & J. Kitzinger (Eds.), *Developing focus group research: Politics, theory and practice* (pp. 156–172). Sage Publications Ltd. doi: <https://doi.org/10.4135/9781849208857.n11>
- Koivisto, J., & Sarsa, H. (2014, September 3). *Does gamification work?: A literature review of empirical studies on gamification* [Conference paper]. 8th Mediterranean Conference on Information Systems, Verona, Italy. doi: <https://journals.sagepub.com/doi/pdf/10.1177/0362153711410082>
- Kowal, J., & Fortier, M. S. (1999). Motivational determinants of flow: Contributions from selfdetermination theory. *The Journal of Social Psychology*, 139(3), pp.355-368.
- Krueger, S. (2002). Analyzing and reporting focus group results. In M. Morgan (Ed.), *Successful focus groups: Advancing the state of the art* (pp. 89-106). Sage Publications.
- Krug, S. (2014). *Don't make me think: A common sense approach to web usability*. New Riders.
- Kumar, J., & Herger, M. (2013). *Gamification at work: Designing dngaging business software*. Interaction Design Foundation.
- Kuutti, J., (2013). *Designing gamification* [Unpublished Master Thesis, Oulu Business School and University of Oulu].
- Leech, N. L., & Onwuegbuzie, A. J. (2009). A typology of mixed methods research

- designs. *Quality & quantity*, 43(2), 265-275.
- Lee, C., & Johnson, A. (2018). Teacher feedback and continuous learning: A longitudinal study. *Journal of Teacher Education*, 72(4), 501-515.
- Lee, J. & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly*, 15(2), 1-5.
- Lepper, M., R. (1988). Motivational considerations in the study of instruction. *Cognition and Instruction*, 5(4), 289-309.
- Li, W., Grossman, T., & Fitzmaurice, G. (2012, October 7). *GamiCAD: A gamified tutorial system for first time autocad users* [Conference paper]. 25th Annual ACM Symposium on User Interface Software and Technology, Ontario, Canada.
- Malinowski, B. (1922). *Argonauts of the Western Pacific*. Routledge.
- Malone, T. W., & Lepper, M. R. (1987). Making learning fun: A taxonomy of intrinsic motivations for learning. In Snow, R. E., & Farr, M. J., (Eds.) *Aptitude, learning, and instruction*. Lawrence Erlbaum Associates.
- Marczewski, A. (2015). User Types. In Marczewski, A. (Ed.), *Even ninja monkeys like to play: Gamification, game thinking & motivational design* (pp. 69–84). CreateSpace Independent Publishing Platform.
- McDonald, M., Musson, R., & Smith, R. (2008). Using productivity games to Prevent Defects. In M. McDonald, R. Musson, & R. Smith (Eds.), *The Practical Guide to Defect Prevention* (pp. 79–95). Redmond: Microsoft Press.
- Mekler, E. D., Brühlmann, F., Tuch, A. N., & Opwis, K. (2017). Towards understanding the effects of individual gamification elements on intrinsic motivation and performance. *Computers in Human Behavior*, 71, 525-534.
- Mert Yıldırım, Y. (2019). Oyunlaştırma uygulamasında kullanılan oyun elementlerine yönelik öğretmen ve öğrencilere uygulanan motivasyon ve teknoloji kabul çalışması. *Türkiye Eğitim Dergisi*, 4(2), 104-126. Retrieved from <https://dergipark.org.tr/tr/pub/turkegitimdergisi/issue/50695/649541>
- Meşe, C. (2016). *Harmanlanmış öğrenme ortamlarında oyunlaştırma bileşenlerinin etkililiği*. (Tez No: 438244) [Doktora Tezi, Anadolu Üniversitesi, Eğitim Bilimleri Enstitüsü]. YÖK Tez Merkezi.
- Mills, G. E., & Gay, L. R. (2019). *Educational research: Competencies for analysis and applications*. Pearson.

- Morgan, D. L. (1996). *Focus groups as qualitative research* (Vol. 16). Sage Publications.
- Morse J. M., & Cheek J. (2015). Introducing qualitatively-driven mixed-method designs. *Qualitative Health Research*, 25(6), 731-733. doi:10.1177/1049732315583299
- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40(2), 120-123.
- Morse, J. M. (2016). *Mixed method design: Principles and procedures*. Routledge.
- Muntean, C. I. (2011, October 28). Raising engagement in e-learning through gamification [Conference paper]. 6th International Conference on Virtual Learning (ICVL), Cluj-Napoca, Romania.
- Nacke, L. E., Bateman, C., & Mandryk, R. L. (2014). BrainHex: A neurobiological gamer typology survey. *Entertainment Computing*, 5(1), 55-62. doi: <https://doi.org/10.1016/j.entcom.2013.06.002>
- Nelson, M. J., (2012, October 3). *Soviet and American precursors to the gamification of work* [Conference paper]. 16th International Academic MindTrek Conference, Tampere, Finland.
- Neuman, W. L. (2013). *Social research methods: Qualitative and quantitative approaches* (7th ed.). Pearson.
- Nicholson, S. (2015). A RECIPE for meaningful gamification. In Wood, L. & Reiners, T., eds. *Gamification in education and business*, New York: Springer. 1-20. doi: http://dx.doi.org/10.1007/978-3-319-10208-5_1
- Nov, O., & Arazy, O. (2013, February 23). *Personality-targeted design: theory, experimental procedure, and preliminary results* [Conference paper]. 2013 Conference on Computer Supported Cooperative Work, San Antonio Texas USA.
- O'Donovan, S. (2012, October 7). *Gamification of the games course* [Conference paper]. South African Institute for Computer Scientists and Information Technologists Conference. University of Cape Town.
- Oprescu, F., Jones, C., & Katsikitis, M. (2014). I play at work—ten principles for transforming work processes through gamification. *Frontiers in Psychology*, 5, 1-5. doi: <https://doi.org/10.3389/fpsyg.2014.00014>
- Organisation for Economic Cooperation and Development. (2019). *TALIS 2018*

- results. (Volume I): *Teachers and school leaders as lifelong learners*, Paris: OECD Publishing.
- Orji, R., Mandryk, R. L., Vassileva, J., & Gerling, K. M. (2013, April 27). *Tailoring persuasive health games to gamer type*. The Sigchi Conference on Human Factors in Computing Systems, Paris, France.
- Özcan, Ş. (2019). Eğitimde oyunlaştırma üzerine yapılan araştırmalara ilişkin bir meta analiz çalışması. (Tez No: 558949) [Yüksek Lisans Tezi, Fırat Üniversitesi, Eğitim Bilimleri Enstitüsü]. YÖK Tez Merkezi.
- Özkan, Z., & Samur, Y. (2017). Oyunlaştırma yönteminin öğrencilerin motivasyonları üzerine etkisi. *Ege Eğitim Dergisi*, 18(2), 857-886. doi: 10.12984/egeefd.314801
- Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage Publications.
- Powell, R. A., Single, H.M., & Lloyd, K. R. (1996). Focus groups in mental health research: Enhancing the validity of user and provider questionnaires. *International Journal of Social Psychiatry*, 42(3), 193-206.
- Prensky, M. (2001). *Digital game-based learning: Fun, play and games. What makes games engaging?* McGraw-Hill.
- Prensky, M. (2005). Complexity matters. *Educational Technology*, 45(4), 1-15.
- Rapp, A. (2015). A qualitative investigation of gamification: Motivational factors in online gamified services and applications. In S. Turkay, & C. K. Kinzer, *Gamification: Concepts, methodologies, tools, and applications* (pp. 32-48). IGI Global.
- Rigby, S. C. (2015). Gamification and Motivation. In S. P., Waltz, & S. Deterding (Eds.), *The gameful world: Approaches, issues, applications* (s. 65–80). MIT Press.
- Rodrigues, L. F., Oliveira, A., & Costa, C. J. (2016). Playing seriously—how gamification and social cues influence bank customers to use gamified e-business applications. *Computers in Human Behavior*, 63, 392-407.
- Ryan, R. M., ve Deci, E. L. (2000). Self-determination theory and facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey.

- International Journal of Human-Computer Studies*, 74, 14-31, doi: doi:https://doi.org/10.1016/j.ijhcs.2014.09.006.
- Sailer, M., Hense, J. U., Mayr, S. K., & Mandl, H. (2017). How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction. *Computers in Human Behavior*, 69, 371-380. doi: https://doi.org/10.1016/j.chb.2016.12.019
- Sarı, A. ve Altun, T. (2016). Oyunlaştırma yöntemi ile işlenen bilgisayar derslerinin etkililiğine yönelik öğrenci görüşlerinin incelenmesi. *Turkish Journal of Computer and Mathematics Education*, 7(3), 553-577. doi: 10.16949/turkbilmat.277871
- Schönbohm, A., & Urban, K. (2014). *Can gamification close the engagement gap of generation Y?: A pilot study from the digital startup sector in Berlin*. Logos Verlag Berlin GmbH.
- Schönen, R. (2014). *Gamification in change management processes*. [BA Thesis, University of Applied Sciences Munich].
- Siemens, G. (2012, July 25). *MOOCs are really a platform*. Elearnspace. Retrieved from <http://www.elearnspace.org/blog/2012/07/25/moocs-arereally-a-platform/>
- Smith, J. (2022). *Gamification: Enhancing learning through motivation and engagement*. Publisher.
- Smith, A. (2018). *Observational research methods*. Academic Press.
- Steinkuehler, C., Squire, K., & Barab, S. (Eds.). (2012). *Games, learning, and society: Learning and meaning in the digital age*. Cambridge University Press.
- Su, C. H., & Cheng, C. H. (2015). A mobile gamification learning system for improving the learning motivation and achievements. *Journal of computer assisted learning*, 31(3), 268-286
- Şahin, M. (2015). *Oyunlaştırılmış oyun temelli öğrenmenin öğrencilerin fen bilimleri dersi başarılarına ve derse yönelik tutumlarına etkisi* (Tez No: 414602) [Yüksek Lisans Tezi, Bahçeşehir Üniversitesi, Eğitim Bilimleri Enstitüsü]. YÖK Tez.
- Şahin, Y. L., Karadağ, N., Bozkurt, A., Doğan, E., Kılınç, H., Uğur, S., & Güler, C. (2017). Uzaktan eğitimde oyunlaştırma kullanımı: Oyunlaştırılmış web tabanlı bir alıştırma uygulaması. *Turkish Online Journal of Qualitative Inquiry*,

- 8(4), 372-395. doi: 10.17569/tojqi.329742
- Şen, B. (2019). *Oyunlaştırma temelli mobil uygulamalarda arayüz tasarımı*. (Tez No: 582802) [Yüksek Lisan Tezi, Işık Üniversitesi, Sosyal Bilimler Enstitüsü]. YÖK Tez.
- Sezgin, S., Bozkurt, A., Yılmaz, E. A., Van der Linden, N., & Learning, P. (2020). Gamification, education and theoretical approaches: Motivation, engagement and sustainability in learning processes. *Mehmet Akif Ersoy University Journal of Education Faculty*, 45, 169–189. doi: <https://doi.org/10.1590/1807-7692bar2019180103>
- Tashakkori, A., & Teddlie, C. (Eds.), (2003). *Handbook of mixed methods in social and behavioral research*. SAGE.
- Tashakkori, A., & Teddlie, C. (Eds.), (2010). *Sage handbook of mixed methods in social & behavioral research*. Sage Publications.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE.
- Teddlie, C., & Tashakkori, A. (2015). *Karma yöntem araştırmalarının temelleri*. Anı Yayıncılık.
- Tondello, G. F., Wehbe, R. R., Diamond, L., Busch, M., Marczewski, A., & Nacke, L. E. (2016, October 16). *The gamification user types hexad scale*. 2016 Annual Symposium on Computer-Human Interaction in Play, Austin, Texas, USA. Adaptation of the Gamification User Types Hexad Scale into Turkish. Available from: https://www.researchgate.net/publication/325257130_Adaptation_of_the_Gamification_User_Types_Hexad_Scale_into_Turkish [accessed Oct 13 2022].
- Tsay, C. H. H., Kofinas, A., & Luo, J. (2018). Enhancing student learning experience with technology-mediated gamification: An empirical study. *Computers & Education*, 121, 1-17.
- Tseng, F. C. (2011). Segmenting online gamers by motivation. *Expert Systems with Applications*, 38(6), 7693-7697.
- Tunga, Y., & İnceoğlu, M. M. (2016, April 26). *Oyunlaştırma tasarımı* [Conference paper]. 3rd International Conference on New Trends in Education, Antalya, Turkey.

- Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE Review*, 41(2), 16-30.
- Werbach K., & Hunter D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press.
- Werbach, K., & Hunter, D. (2015). *The gamification toolkit: Dynamics, mechanics, and components for the win*. Wharton Digital Press.
- Whyte, W. F. (1943). *Street corner society*. University of Chicago Press.
- Wittgenstein, L. (1976). *Philosophical investigations* (3rd ed.). Basil Blackwell.
- Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, 114(4), 843-863.
- Wu, M. (2011). *Gamification 101: The psychology of motivation*. Retrieved January 12, 2016 from <https://community.lithium.com/t5/Science-of-Social-blog/Gamification-101-The-Psychology-of-Motivation/ba-p/21864>.
- Xu, Y. (2011). *Literature review on web application gamification and analytics*. CSDL Technical Report, 11-05.
- Yee, N. (2002). *Five motivation factors for why people play MMORPGs*. The Daedalus Project. Retrieved from <http://www.nickyee.com/facets/home.html>
- Yee, N. (2006). Motivations for play in online games. *CyberPsychology & Behavior*, 9(6), 772-775. doi: 10.1089/cpb.2006.9.772
- Yee, N., Ducheneaut, N., & Nelson, L. (2012, May 5). Online gaming motivations scale: Development and validation [Conference paper]. SIGCHI Conference on Human Factors in Computing Systems, Austin Texas, USA. doi: <https://doi.org/10.1145/2207676.2208681>
- Yıldırım, İ. (2016). *Oyunlaştırma temelli öğretim ilke ve yöntemleri dersi öğretim programının geliştirilmesi, uygulanması ve değerlendirilmesi*. (Tez No: 422970) [Doktora Tezi, Gaziantep Üniversitesi, Eğitim Bilimleri Enstitüsü]. YÖK Tez Merkezi.
- Yılmaz, E., (2015). *Oyunlaştırma*. Abaküs.
- Yılmaz, E. A. (2016). *Herkes için oyunlaştırma*. Abaküs Yayınları.
- Yılmaz, E. A. (2018). *İş'te oyunlaştırma*. Ceres Yayınları.
- Yılmaz, R., & Karaoglan Yılmaz, F. G. (2019, Eylül 12). *Bir oyunlaştırma ve biçimlendirici değerlendirme aracı olarak kahoot kullanımına yönelik öğretmen adaylarının görüşlerinin incelenmesi* [Bildiri]. II. Uluslararası

Eğitimde ve Kültürde Akademik Çalışmalar Sempozyumu, Denizli, Türkiye.
Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps*. O'Reilly Media, Inc



APPENDICES



Appendix A (English): Expert Interview Form

1. As a field expert, what do you think about the use of games and gamification in adult education?

1. Could you give an example of one of the existing applications that you like the most? Why do you like this app in particular?
2. In your opinion, what effects can games and gamification have on the education process? Do you have an example you can share with us?

2. In your opinion, what should be the starting point for gamification of adult education? In other words, why do you think we should gamify adult education? Or should we not gamify it? Why do we need this?

3. With the pandemic, in-service teacher training has started to be carried out partly on digital platforms. What kind of gamification system would you recommend to improve in-service teacher trainings conducted on digital platforms?

1. In terms of system usability
2. In terms of system sustainability
3. In terms of entertainment elements

4. What are the gamification elements that you think would support the adult education process in a gamification module to be integrated into adult education (and specifically an online teacher training platform)?

1. Gamification mechanics
2. Gamification dynamics
3. Gamification components

5. What are the most common mistakes made during the gamification process of an education? What do you recommend we pay attention to during the planning and

design process?

6. What are your suggestions regarding software development and the technologies to be used in the design of the gamification extension?
7. Is there anything else you would like to add?



Appendix B (Turkish): Uzman Görüşme Formu

1. Bir alan uzmanı olarak oyun ve oyunlaştırmanın yetişkin eğitiminde kullanılması hakkında ne düşünüyorsunuz?

1. Var olan uygulamalar arasından en çok beğendiğiniz bir tanesini örnek verebilir misiniz? Neden bu uygulamayı özellikle beğeniyorsunuz?
2. Sizce oyun ve oyunlaştırmanın eğitim sürecine etkileri neler olabilir? Bizimle paylaşabileceğiniz bir örneğiniz var mı?

2. Size göre, bir yetişkin eğitiminin oyunlaştırması için çıkış noktası ne olmalıdır? Diğer bir deyişle sizce neden bir yetişkin eğitimi oyunlaştırmalıyız? Veya oyunlaştırmamalıyız? Buna neden ihtiyaç duyarız?

3. Pandemiyle birlikte, hizmetiçi öğretmen eğitimleri de kısmen dijital platformlarda gerçekleştirilmeye başlanmıştır. Dijital platformlarda yürütülen hizmetiçi öğretmen eğitimlerini geliştirmek için nasıl bir oyunlaştırma sistemi önerirsiniz?

1. Sistem kullanılabilirliği açısından
2. Sistem sürdürülebilirliği açısından
3. Eğlence unsurları açısından

4. Yetişkin eğitime (ve özelde bir çevrimiçi öğretmen eğitimi platformuna) entegre edilecek bir oyunlaştırma modülünde yetişkin eğitim sürecini destekler nitelikte olduğunu düşündüğünüz oyunlaştırma unsurları nelerdir?

1. Oyunlaştırma mekanikleri
2. Oyunlaştırma dinamikleri
3. Oyunlaştırma bileşenleri

5. Bir eğitimin oyunlaştırma sürecinde en sık yapılan hatalar nelerdir? Planlama

ve tasarım sürecinde nelere dikkat etmemizi önerirsiniz?

6. Oyunlaştırma uzantısının tasarımında yazılım geliştirme ve kullanılacak teknolojiler ile ilgili önerileriniz nelerdir?

7. Eklemek istediğiniz başka bir husus var mı?



Appendix C (English): Mentor Interview Form

1. (Professional development program conducted online) How would you evaluate this training process?

1. Was the process sustainable in terms of duration? (Long/short time)
2. Was the platform used discoverable and easy to learn for you? (Google Classroom)
3. Did the process provide the opportunity to create an interactive environment?
 1. Platform and user interaction
 2. Interaction between user and other users
 3. Interaction between user and expert
4. The process was carried out with more individuals / groups. Did this situation please you? How would it be your preference?

2. How was it for you when you evaluated the online training process, taking into account elements such as entertainment and motivation?

1. What is your main source of motivation in the process?
 1. To contribute to the personal development of teachers
 2. Contributing to your personal development by transferring knowledge and experience with teachers and other experts in an online in-service training
2. Did the fact that there was a defined flow in the process, that guidance was given regarding the steps to be taken, and that the steps to be implemented were determined, had a positive effect on you? Would you prefer more detailed guidance or more freedom?

3. Based on your experience with any online professional development programs (that you have attended in the role of trainee):

1. Would it be more convenient for you to make individual plans and

implement them in the training processes, or to make a plan by the manager and have everyone implement it?

2. Would being able to track your progress motivate you more? Do you think you would prefer a phased process? Or would you prefer to be able to control the entire process simultaneously?
 3. Is receiving a concrete reward (certificate, etc.) other than the achievements during the training process an important factor in your participation in such trainings?
 4. Would it motivate you more to be informed about the progress of other learners during the educational process and to stay in touch and support them when necessary?
 5. How does not explaining some parts of the process from the beginning and discovering the process yourself affect your motivation for education?
4. Do you think that a gamified education process can support good and permanent learning compared to learning with classical methods?
1. What is the indispensable element of the gamified learning process and environment you dream of?

Appendix D (Turkish): Mentor Görüşme Formu

1. (Online olarak yürütülen mesleki gelişim programı) Bu eğitim sürecini nasıl değerlendirirsiniz?

1. Süreç süre bakımından sürdürülebilir bir boyutta mıydı? (Uzun / kısa süre)
2. Kullanılan platform sizin için keşfedilebilir, kolay öğrenilebilir miydi? (Google Classroom)
3. Süreç etkileşimli bir ortam yaratabilmeye fırsat tanıyor muydu?
4. Platform ve kullanıcı etkileşimi
5. Kullanıcı ve diğer kullanıcılar arası etkileşim
6. Kullanıcı ve uzman arası etkileşim
7. Süreç daha fazla bireysel / grupla yürütüldü. Bu durum sizi memnun etti mi? Nasıl olması tercihiniz olurdu?

2. Online olarak yürütmüş olduğunuz bu eğitim sürecini eğlence ve motivasyon gibi unsurları göz önünde bulundurarak değerlendirdiğinizde sizin için nasıldı?

1. Süreçte asıl motivasyon kaynağınız nedir?
2. öğretmenlerin kişisel gelişimlerine katkıda bulunabilmek
3. Online olarak yürütülen bir hizmetiçi eğitimde öğretmenler ve diğer uzmanlarla bilgi ve deneyim aktarımı ile kişisel gelişiminize katkıda bulunmak
4. Süreçte belirlenmiş bir akışın olması, uygulanması gereken adımlara dair yönlendirmelerin iletilmesi ve uygulanacak olan adımların belirlenmiş olması sizi olumlu yönde etkiliyor muydu? Tercihiniz daha detaylı bir yönlendirme mi daha özgür bırakılmak mı olurdu?

3. Herhangi bir online yürütülen mesleki gelişim programlarına dair deneyiminizden yola çıkarak (Eğitim alan rolünde katıldığınız):

1. Eğitim süreçlerinde bireysel planların yapılıp uygulanması mı

yönetici tarafından bir plan yapıp herkesin bunu uygulaması mı sizin için daha uygundur?

2. Süreçte ilerlemenizi takip edebilmeniz sizi daha fazla motive eder mi? Sizce aşamalandırılmış bir süreç mi tercih edersiniz? Yoksa tüm süreci eş zamanlı kontrol edebilmeyi mi tercih edersiniz?
 3. Eğitim sürecindeki kazanımlar haricinde somut olarak bir karşılık almak (sertifika vs.) bu tarz eğitimlere katılmanızda önemli bir unsur mudur?
 4. Eğitim süreçlerinde diğer öğrenenlerin ilerleme durumundan haberdar olmak ve iletişimde kalmak, gerektiğinde onları destekleyebilmek sizi daha fazla motive eder mi?
 5. Sürece dair bazı kısımların en başından açıklanmaması ve süreci sizin keşfetmeniz eğitime olan motivasyonunuzu nasıl etkiler?
4. Klasik yöntemlerle öğrenme ile kıyaslandığında oyunlaştırılmış bir eğitim sürecinin iyi ve kalıcı öğrenmeyi destekleyebileceğini düşünüyor musunuz?
1. Hayal ettiğiniz oyunlaştırılmış öğrenme sürecinin ve ortamının vazgeçilmez ögesi nedir?

Appendix E (English): Teacher Interview Form

1. How would you evaluate the project process of "Designing and Evaluating the Effectiveness of the Scientific Inquiry Supported Online Mentoring (E-Scaffolding) Model in In-Service Education" within the scope of TÜBİTAK 1001 in terms of the environment in which the education is carried out?
2. How do you like the fact that the entire training process is carried out on a digital platform?
3. How do you evaluate your Google Classroom experience, the digital platform where education is carried out, in terms of usability?
 1. Have you used Google Classroom before?
 2. Was Google Classroom a discoverable or easy-to-learn platform for you?
4. Do you think that the platform you use provides the opportunity to create an interactive environment??
 1. For example, were you able to receive feedback from the platform while performing the tasks assigned to you? Was there any feedback on the platform that would tell you "The task was completed, you earned this by completing this task" or as a warning for a task you left incomplete? (user-platform interaction)
 2. Were you able to interact with other participants using the platform during the training process? For example, commenting, liking, etc. (user-user interaction))
 3. Did it offer the opportunity to simultaneously evaluate the feedback videos your mentors sent you? (user-expert interaction)
5. If the platform in which the training would be carried out was left to your choice, which would be your first choice among face-to-face, online or hybrid? From where?
6. What can you say when you evaluate this online training process, taking

into account motivational factors?

1. What was your main source of motivation during the process?
 1. Earning an important certificate as a result of good education
 2. You can improve yourself by exchanging information with your colleagues and experts in line with your experiences
2. Did Google Classroom offer you a sustainable environment?
3. Were there any tools that could trigger you to continue using the platform?
 1. Gaining and losing points as a result of your successful or unsuccessful actions, gaining new powers as a result of your actions, etc.
4. Would you describe your education process and Google Classroom experience as 'boring' or 'fun'?
7. Is it an important source of motivation for you to participate in such trainings, apart from the cognitive gains you have gained during the training process, to receive a concrete reward (certificate, professional score, impact on salary, etc.)?
8. Would you prefer a process in which you receive guidance during the training process or a process that you individually control yourself?
 1. Having a manager in the process and moving towards the goal in line with the framework drawn by the manager (for example, I give them weekly plans and remind them during the week)
 2. To leave the plan to the user individually according to the set goal, to complete what he / she needs to accomplish according to his / her own preference without the need for stimulation in a certain period of time (for example, courses such as udemy courses, where there will be no change in the flow in a certain process, where the time to complete the course is left to the user)
9. Would being able to track your own progress during the training process motivate you more?

10. Would it motivate you more to be aware of other participants' progress, to stay in touch and to be able to support them when needed?
11. How does not having all the explanations and instructions for the training process explained in advance and discovering the process yourself affect your motivation for the training? For example, does it make you feel uncomfortable or excited to encounter random situations?
12. Do you play games?
 1. What kind of games?
 2. Digital? Analog?
 3. With your children? Alone? With friends?
13. Why do you play games?
 1. Novelty, change, fun, competition, socialization, relaxation, excitement, escape...
14. Why do you prefer a game you play most often? What are the factors that encourage you to play that game and keep you playing it?
15. In the light of all this, I would like to return to the platform where your in-service training within the scope of the Project took place. How do you feel about the idea of having the factors that excite you about games, that make you "play games" on a training platform?
16. In this context, which of these game features would you prefer to have in an educational platform?
17. Do you have any other points, comments or suggestions to add?

Appendix F (Turkish): Öğretmen Görüşme Formu

1. TÜBİTAK 1001 kapsamında “Hizmetiçi Eğitimde Bilimsel Sorgulama Destekli Çevrimiçi Mentorluk (E-Scaffolding) Modelinin Tasarlanması ve Etkililiğinin Değerlendirilmesi” projesi sürecini eğitimin gerçekleştirildiği ortam açısından nasıl değerlendirirsiniz?
2. Eğitim sürecinin tamamının dijital bir platform üzerinden yürütülmüş olmasını nasıl buldunuz?
3. Eğitimin yürütüldüğü dijital platform olan Google Classroom deneyiminizi kullanılabilirlik açısından nasıl değerlendiriyorsunuz?
 1. Google Classroom’u daha önce kullanmış mıydınız?
 2. Google Classroom sizin için keşfedilebilir veya kolay öğrenilebilir bir platform muydu?
4. Kullandığınız platformun etkileşimli bir ortam yaratabilmeye fırsat tanıdığını düşünüyor musunuz?
 1. Örneğin size verilen görevleri gerçekleştirirken platformdan geri bildirim alabildiniz mi? Platformda herhangi tamamlanmış bir görevde size “Görev tamamlandı, bu görevi de tamamlayarak şunu kazandınız” ya da eksik bıraktığınız bir görev için uyarı mahiyetinde geri bildirimler var mıydı? (kullanıcı-platform etkileşimi)
 2. Eğitim sürecinde platformu kullanarak diğer katılımcılarla etkileşime geçebildiniz mi? Örneğin yorum yapmak, beğenmek gibi (kullanıcı-kullanıcı etkileşimi)
 3. Mentörlerinizin size iletmiş oldukları geri bildirim videolarını eş zamanlı olarak değerlendirme fırsatı sunuyor muydu? (kullanıcı-uzman etkileşimi)
5. Eğitimin gerçekleştirileceği platform sizin tercihinize bırakılsa, yüzyüze - çevrimiçi veya hibritten hangisi sizin için ilk seçenek olurdu? Neden?
6. Online olarak yürütmüş olduğunuz bu eğitim sürecini motivasyon unsurları

göz önünde bulundurarak değerlendirdiğinizde neler söyleyebilirsiniz?

1. Süreçte asıl motivasyon kaynağınız neydi?
 1. iyi bir eğitim sonucunda önemli bir sertifika kazanmak
 2. meslektaşlarınız ve uzmanlarla deneyimleriniz doğrultusunda bilgi alışverişi yaparak kendinizi geliştirebilmeniz
2. Google Classroom size sürdürülebilir bir ortam sunuyor muydu?
3. Platformu kullanmaya devam etmek adına sizi tetikleyebilecek bir takım araçlar var mıydı?
 1. Başarılı ya da başarısız eylemleriniz neticesinde puan kazanıp kaybetmek, eylemleriniz neticesinde yeni yetkiler kazanmak .. gibi
4. Eğitim süreci ve Google Classroom deneyiminizi ‘sıkıcı’ veya ‘eğlenceli’ olarak nitelendirebilir misiniz?
7. Eğitim sürecindeki elde ettiğiniz bilişsel kazanımlar haricinde somut olarak bir karşılık alabilmek bu tarz eğitimlere katılmanız için önemli bir motivasyon kaynağı mıdır (sertifika, mesleki açıdan puan, maaşa etki vs.)?
8. Eğitim sürecinde yönlendirmeler aldığınız bir süreci mi yoksa bireysel olarak kendi kontrolünüzde olan bir süreci mi tercih edersiniz?
 1. Süreçte bir yöneticinin olması ve yöneticinin çizdiği çerçeve doğrultusunda hedefe ilerlemek (örnek olarak benim onlara haftalık planları verip hafta içerisinde hatırlatıyor olmam)
 2. Belirlenen hedefe göre planı bireysel olarak ona bırakmak, gerçekleştirmesi gerekenleri belirli bir sürede uyarana ihtiyaç duymadan kendi tercihine göre tamamlamak (örnek olarak udemy kursları gibi akışı belli süreç içerisinde bir değişikliğin olmayacağı, kursu bitirme süresinin kullanıcıya bırakıldığı kurslar)
9. Eğitim sürecinde kendi ilerlemenizi takip edebilmeniz sizi daha fazla motive eder mi?
10. Peki diğer katılımcıların ilerleme durumundan haberdar olmak ve iletişimde kalmak, gerektiğinde onları destekleyebilmek sizi daha fazla motive eder miydi?

11. Eğitim sürecine dair tüm açıklamaların ve yönergelerin önceden açıklanmaması ve süreci sizin keşfetmeniz eğitime olan motivasyonunuzu nasıl etkiler? Örneğin rastlantısal durumlarla karşılaşmak sizi rahatsız hissettirir mi yoksa heyecan mı verir?

12. Oyun oynar mısınız?

1. Ne tür oyunlar?
2. Dijital? Analog?
3. Çocuklarınızla? Yalnız? Arkadaşlarınızla?

13. Neden oyun oynuyorsunuz?

1. Yenilik, değişiklik, eğlence, rekabet, sosyalleşme, rahatlama, heyecan, kaçış..

14. En sık oynadığınız bir oyunu niye tercih ediyorsunuz? Sizi o oyunu oynamaya sevk eden, bırakmamanızı sağlayan faktörler nelerdir?

15. Bütün bunlar ışığında, Proje kapsamındaki hizmetiçi eğitiminizin gerçekleştiği platforma tekrar dönmek istiyorum. Oyunlarla ilgili olarak sizi heyecanlandıran, size “oyun oynatan” faktörlerin bir eğitim platformunda olması fikri size nasıl geliyor?

16. Bu kapsamda bu oyun özelliklerinden hangilerinin bir eğitim platformunda olmasını tercih edersiniz?

17. Başka eklemek istediğiniz bir husus, görüş veya öneriniz var mı?

Appendix G (Turkish): Oyunlaştırma için Kullanıcı Türleri Ölçeği

Yeniden Düzenlenmiş “Oyunlaştırma için Kullanıcı Türleri Ölçeği” (HEXAD)

Değerli katılımcı, 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. 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 etkidir.							
8.	Karışıklık çıkarmak için başkalarını yönlendirmek hoşuma gider.							
9.	Bir ekibin parçası olmaktan hoşlanırım.							
10.	Alışla 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.							

Appendix H : Permission to use the User Types Scale for Gamification

ÖLÇEK KULLANIM İZNİ Getir Kütüphane X

 **fatma yıldırım** 2 Haz 2022 16:40   

Merhaba Hocam,

Muğla Sıtkı Koçman Üniversitesi Fen Bilimleri Enstitüsünde, Dijital Oyun Tasarımı ve Teknolojileri bölümünde Doç.Dr. Müge ADNAN danışmanlığında yüksek lisans yapmaktayım.

Tez çalışmamda faydalanabilmek adına sizin * *Taskin, N., & Kiliç Çakmak, E. (2020). Adaptation of Modified Gamification User Types Scale into Turkish. Contemporary Educational Technology, 12(2).* * küniteli makalenizde Ebru hoca ile gerçekleştirmiş olduğunuz ölçek çalışmasının maddelerini ve türkçesini arz ediyorum. Hem tez raporunda hem de tez kapsamında üretilcek yayınlarda makalenize atfı vererek ölçeği kullanacağımızı belirtmek isterim.

Teşekkür ederim, kolaylıklar diliyorum.

 **Necati TAŞKIN** 3 Haz 2022 14:54   

Merhaba Hocam,

Ölçeği bilimsel kurallara uygun biçimde atfı yapılarak kullanabilirsiniz. Ölçeğe ilişkin Türkçeye uyarlanmış maddeler ekleddi. Kullanımına ilişkin sormak istediğiniz, aklınıza takılan, her durumu sorabilirsiniz. Size yardımcı olmaktan memnuniyet duyacağımı bilmenizi isterim.

İyi Çalışmalar,

Dr. Öğr. Üyesi, Necati TAŞKIN

Appendix I: Sample Screenshot: Meta-Matrix Used for Cross-Case Analysis

Themes	Codes	G1	G2	M1	M2	M3	M4	M5	M6	U1	U2	U3
Attributes	Task oriented	X	X			X						
Attributes	Planned study	X			X	X	X					
Attributes	Uncertainty	X	X			X						
Attributes	Experience	X										
Attributes	Readiness										X	
Attributes	Personalization		X				X					
Attributes	Stay away from technology						X					
Communication, interaction and collaboration	Team		X	X	X	X		X	X			
Communication, interaction and collaboration	Interaction	X	X								X	
Communication, interaction and collaboration	Communication	X	X	X					X			
Communication, interaction and collaboration	Keep online	X	X					X				
Communication, interaction and collaboration	Sociability	X	X			X			X			
Communication, interaction and collaboration	Insufficient interaction	X	X		X	X		X	X			
Context	Systematic training	X							X			
Context	Economic		X						X			
Context	Flexibility		X									
Context	Contents			X		X	X	X			X	
Context	Practicality											X
Context	Independent of time and place	X	X									
Context	Medium	X	X									
Game based learning	Progressive learning		X									X
Game based learning	Effective learning										X	
Game based learning	Permanent learning		X	X								
Game based learning	Microlearning	X									X	X
Game based learning	Tutorial tool	X										
Game types	Analog games	X	X									
Game types	Digital games	X	X									
Gamification dynamics	Feelings									X	X	
Gamification dynamics	Escape	X										
Gamification dynamics	Mystery							X				

Gamification dynamics	Goals				X	X					X	
Gamification dynamics	Rivalry	X	X	X	X							X
Gamification dynamics	Reversible									X		X
Gamification dynamics	Story-based									X	X	
Gamification dynamics	Follow up	X	X	X	X		X	X	X	X	X	
Gamification elements	User control	X	X	X					X			
Gamification elements	Reminder	X	X		X			X				
Gamification elements	Boss fight	X										
Gamification elements	Point	X	X	X	X			X		X		
Gamification elements	Level			X								
Gamification elements	Calendar	X		X					X			
Gamification elements	Badges						X	X				
Gamification mechanics	Challenge	X										
Gamification mechanics	Loop				X			X				X
Gamification mechanics	Feedback	X	X	X			X	X		X	X	
Gamification mechanics	Duty	X	X	X	X		X	X	X			
Gamification mechanics	Win/Lose states	X										
Gamification mechanics	Rewards	X	X	X	X			X	X	X	X	
Gamification mechanics	Reset	X										
Gamification mechanics	Chance	X										
Gamification mechanics	Competition		X	X	X							
Motivation	Get a habit				X							
Motivation	Entertainment	X	X		X	X	X		X	X	X	
Motivation	Be criticized		X									
Motivation	Awareness		X									
Motivation	Volunteering			X				X				X
Motivation	Integration into daily life	X	X		X					X	X	
Motivation	Self-improvement		X	X	X		X				X	
Motivation	Obligation	X										
Motivation	Professional development		X									
Motivation	Motivation	X	X		X	X	X	X		X	X	X

Motivation	Regenerate	X										
Motivation	Guidance	X	X	X	X	X	X	X				
Supportive learning environment	Support			X				X			X	
Supportive learning environment	Participation	X										
Supportive learning environment	Expert support	X	X						X			
Design	Focused design	X										X
Design	Universal design	X	X					X				X
Design	Advanced gamification	X	X							X		
Design	Discoverability	X	X			X	X				X	
Design	User friendly	X	X		X	X	X		X		X	X
Design	Multisensorial	X										
Design	Gamified interface							X				
Design	Gamification elements								X			
Design	Advanced platform design		X							X	X	
Technical infrastructure	Cloud storage		X									
Technical infrastructure	System speed							X				
Technical infrastructure	Technical problems	X	X		X	X						
Technical infrastructure	Data security						X					
Usefulness	Equality		X									
Usefulness	Ease of Use	X	X						X			
Usefulness	Permanent access		X									

Appendix J: Quantitative Data Analysis Code

```
import numpy as np # linear algebra
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

import os
for dirname, _, filenames in os.walk('/kaggle/input/usertype'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# Read data from Excel file
excel_path = '/kaggle/input/usertype/usertypes.xlsx' # Excel dosyasının yolu

df_kategoriler = pd.read_excel(excel_path)

socialiser_columns = ['s1', 's2', 's3', 's4']
free_spirit_columns = ['f4', 'f3', 'f2', 'f1']
achiever_columns = ['a4', 'a1', 'a3', 'a2']
philanthropist_columns = ['p1', 'p2', 'p3', 'p4']
player_columns = ['r3', 'r2', 'r1', 'r4']
disruptor_columns = ['d4', 'd3', 'd1', 'd2']

# Create new DataFrame
df_kategoriler = pd.DataFrame({
    'Socialiser': df[socialiser_columns].values.tolist(),
    'Free spirit': df[free_spirit_columns].values.tolist(),
    'Achiever': df[achiever_columns].values.tolist(),
    'Philanthropist': df[philanthropist_columns].values.tolist(),
    'Player': df[player_columns].values.tolist(),
    'Disruptor': df[disruptor_columns].values.tolist(),
})

# Show new DataFrame
print(df_kategoriler)
# Her bir kategorideki kişi sayısını hesapla
socialiser_count = sum((df[socialiser_columns] >= 5).all(axis=1))
free_spirit_count = sum((df[free_spirit_columns] >= 5).all(axis=1))
achiever_count = sum((df[achiever_columns] >= 5).all(axis=1))
philanthropist_count = sum((df[philanthropist_columns] >= 5).all(axis=1))
player_count = sum((df[player_columns] >= 5).all(axis=1))
disruptor_count = sum((df[disruptor_columns] >= 5).all(axis=1))

# Place results in a DataFrame
result_df = pd.DataFrame({
    'Kategori': ['Socialiser', 'Free spirit', 'Achiever', 'Philanthropist', 'Player',
    'Disruptor'],
    'Number of people who gave at least 5 points or more': [socialiser_count,
```

```

free_spirit_count, achiever_count, philanthropist_count, player_count,
disruptor_count]
})

# Show result
print(result_df)
# Calculate column-wise average of each category
avg_socialiser = df_kategoriler['Socialiser'].apply(lambda x: np.mean(x))
avg_free_spirit = df_kategoriler['Free spirit'].apply(lambda x: np.mean(x))
avg_achiever = df_kategoriler['Achiever'].apply(lambda x: np.mean(x))
avg_philanthropist = df_kategoriler['Philanthropist'].apply(lambda x: np.mean(x))
avg_player = df_kategoriler['Player'].apply(lambda x: np.mean(x))
avg_disruptor = df_kategoriler['Disruptor'].apply(lambda x: np.mean(x))

# Create new DataFrame containing averages
df_ortalamalar = pd.DataFrame({
    'Socialiser': avg_socialiser,
    'Free spirit': avg_free_spirit,
    'Achiever': avg_achiever,
    'Philanthropist': avg_philanthropist,
    'Player': avg_player,
    'Disruptor': avg_disruptor
})

# Calculate column-by-column average of all columns and insert as a new
rowoverall_avg = df_ortalamalar.mean().rename('overall_avg')
df_ortalamalar = pd.concat([df_ortalamalar, overall_avg.to_frame().T])

# Show averages
print(df_ortalamalar)
df_ortalamalar.to_excel('kategori_ortalama.xlsx', index=False)
# Draw a column chart with overall average values
plt.figure(figsize=(10, 6))
sns.barplot(x=df_ortalamalar.columns, y=df_ortalamalar.loc['overall_avg'],
palette='viridis')
plt.title('Average for Each Category', fontsize=16)
plt.xlabel('Categories', fontsize=12)
plt.ylabel('Overall Average', fontsize=12)
plt.xticks(rotation=45, ha='right') # Return column labels
plt.show()

# Create color paletterenk_paleti = sns.color_palette("viridis",
n_colors=len(df_kategoriler.columns))

# Set Seaborn theme
sns.set_theme(style="whitegrid")

# Perform frequency analysis and visualization for each category
for kategori in df_kategoriler.columns:
    frekanslar = pd.Series(df_kategoriler[kategori].sum()).value_counts().sort_index()

```

```
# Create bar chart
plt.figure(figsize=(8, 5))
sns.barplot(x=frekanslar.index, y=frekanslar.values, palette=renk_paleti)

# Remove unnecessary elements like frame, x and y axis labels
sns.despine()

# Add title, x and y axis labels  plt.title(f'Player type: {kategori}',
fontname='Times New Roman', fontsize=16)
plt.xlabel('Value', fontname='Times New Roman', fontsize=12)
plt.ylabel('Frequency', fontname='Times New Roman', fontsize=12)

# Show image
plt.show()
```



PERSONAL INFORMATION

Name, Surname: F***a Y*****RIM

Date of Birth: 1*.0*.199*

Place of Birth: A*****n

EDUCATION

Degree	Institution/University, City,Country	Graduation Year
High School	Yusufeli Teacher Training High School, <i>Artvin, Türkiye</i>	2015
Prep School	Muğla Sıtkı Koçman University, Department of Foreign Language, <i>Muğla, Türkiye</i>	2016
Bachelor	Muğla Sıtkı Koçman University, Department of Technology, Division of Information System and Technology Engineering, <i>Muğla, Türkiye</i>	2020
Master	Muğla Sıtkı Koçman University, Institute of Science and Technology, Division of Digital Game Design and Technology, <i>Muğla, Türkiye</i>	2024

WORK EXPERIENCE

Date	Company, City, Country	Position
07.2018 09.2018	Porto Software, <i>İstanbul, Türkiye</i>	Software Engineer Intern
02.2019 09.2019	Muğla Metropolitan Municipality Information Technology Department, <i>Muğla, Türkiye</i>	Software Engineer Intern
02.2021 02.2023	Mugla Sitki Koçman University Education Faculty - Tubitak, <i>Muğla, Türkiye</i>	Digital Coordinator
02.2023 07.2023	Fundacja Centrum Aktywności Twórczej, <i>Leszno, Poland</i>	ESC Volunteer