Design and Evaluation of a Board Game to Gain Historical Knowledge and Thinking Skills

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Abstract

One of the most significant objectives of the learning and teaching processes is to achieve meaningful learning for the individual; in line with this objective, educators are searching for various methods to accomplish meaningful learning and make it enduring. Following the present age, the sought-after and essential qualified human profile should encompass many diverse skills. While the range of skills aimed to be imparted to individuals of school age has diversified and expanded, knowing history and engaging in historical thinking continues to maintain its relevance and significance. The teaching of historical subjects, as well as the planning, implementation, and evaluation of methods and techniques, presents challenges for the 8th-grade course of The Principles of Atatürk and History of Turkish Revolution due to its structural focus on theoretical knowledge intensity. The emerging generation requires novel techniques. One instructional technique where active learning occurs is through educational games. Educational games are a significant and effective instructional technique that contributes to making the teaching process more efficient and achieving the targeted learning outcomes set by the programs. In Turkey, the number of games designed for history curriculum objectives and the number of studies related to the subject are quite limited. In line with this, this research study aimed to investigate how

university students experience the process of designing a history education-themed board game within the scope of the 8th-grade Principles of Ataturk and History of Turkish Revolution course, aiming to impart historical knowledge and historical thinking skills to students. The study focused on the design, development, and evaluation of the board game, exploring the experiences of students throughout this process.

Keywords: *History education, Innovative learning designs, Educational game design, Interdisciplinary collaboration.*

Introduction

One of the most crucial objectives in learning and teaching is to achieve meaningful learning for individuals. In pursuit of this goal, educators explore various methods to accomplish meaningful and enduring learning experiences. To achieve lasting and meaningful learning, the methods and techniques employed by teachers in the classroom hold significant importance in reaching the designated objective (Doğramacı, 2019). In the context of learning and teaching processes, students' active engagement and participation are pivotal for imparting desired knowledge, skills, and retention and fostering higher-order cognitive abilities such as critical thinking and problem-solving skills (Samuk et al., 2020). It is known that the qualified human profile that needs to be nurtured and is in demand, in line with the current age, should possess a multitude of diverse skills. Although the skills aimed to be imparted to individuals of school age have diversified and increased, knowing history and possessing historical thinking skills remain relevant and important (Akhan, 2022). In this context, history education maintains its significance within the education system.

The Social Studies course emerges as a field formed by synthesizing different disciplines. The Social Studies course aims to assist students in understanding and to interpret their past, reflecting on their present, and shedding light on their future, while also fostering the development of "active citizenship" by establishing a connection between the past and the future (Hanaylı et al., 2020). On the other hand, history education undertakes tasks such as assisting students in establishing connections between the past and future of countries and societies, preparing students for the future, and contributing to individuals' cognitive and affective development (Sığnaktekin, 2022). Teaching history topics, planning methods and techniques, implementing, and evaluating them also pose challenges for the 8th-grade course of "İnkılap Tarihi ve Atatürkçülük" due to its structural emphasis on theoretical knowledge

intensity. Students are expected to recall past events or existing situations, make inferences relevant to the subject, and demonstrate behavioral changes consistent with the objectives of the lesson. In this context, it can be stated that the methods and techniques used in teaching history topics within the framework of the Social Studies course aim to help students comprehend events from the past, instill abstract concepts, and reconstruct experiences that still have relevance in the present, thereby enabling students to visualize them mentally (Karaca et al., 2023). This also allows students to develop their historical thinking skills.

It is known that Social Studies teachers predominantly employ traditional teaching methods and passive learning approaches in their instructional practices (Yaylak, 2020). However, in the present day, the use of the expository teaching method to deliver subjects, objectives, and information in the Social Studies class is gradually losing its significance. Although student-centered approaches are emphasized in the curriculum, research conducted in our country and in many countries around the world, including Europe and America, reveals that despite the prevalence of traditional teaching methods, history education and history topics are perceived as burdened by rote memorization and a heavy load of theoretical knowledge. Consequently, due to the failure to reflect current educational developments and trends, students often view the subject as monotonous, disconnected from real-life experiences, and challenging to relate to. As known, history class is not merely a session for transferring information. Through history lessons, it is possible to impart students advanced thinking skills such as evaluation, synthesis, analysis, and interpretation. (Özcan, 2019) Regarding the foundation of history education, there lies a significant responsibility upon Social Studies teachers for imparting these skills.

Together with the methods and techniques they employ to teach subjects, teachers should create an environment conducive to utilizing students' higher-order cognitive skills and facilitating active learning. This approach will captivate students' attention, transform the class into an engaging experience, and foster a more interested attitude toward history topics (Metin Göksu, 2020). One of the instructional techniques where active learning takes place is through educational games. Educational games are an essential and effective instructional technique for enhancing the efficiency of the teaching process and achieving the objectives set by the curriculum. From a student's perspective, educational games serve as an instructional technique that breaks monotony, enhances attention and motivation, encourages active participation in the learning process, provides opportunities for experiential learning, supports lasting

comprehension, in addition to helping students move beyond rote memorization. Especially for abstract subjects like history within the Social Studies class, game activities in instruction should be employed to enhance retention and facilitate effective learning (Korcu, 2019). Educational games allow students to encounter problems and offer a chance to practice finding solutions, thereby fostering the development of their problem-solving skills. In the environment of play, one of the most natural settings for students, they can express their thoughts comfortably, leading to more effortless learning experiences (Koç, 2019). It should be noted that games also serve as a bridge for communication. The concept of play, which holds significance for children and is present in every aspect of their lives, can yield excellent results when combined with education (Zing, 2019). In this context, it can be said that it is important for the concept of game to play an active role in education.

In Turkey, it is observed that the number of games designed for the objectives of the history curriculum is quite limited, and similarly, the number of studies related to the subject is also scarce. Hence, there is a need for games designed for historical thinking skills and relevant research to be incorporated into History Curriculum Programs (Aydoğan & Karabağ, 2020). The research aims to investigate how university students experience the process of designing, developing, and evaluating a board game focused on imparting historical knowledge and historical thinking skills to students within the scope of the 8th-grade "Principles of Ataturk and History of Turkish Revolution" course.

Research Process

The research consists of two phases. Firstly, the research involved conducting a thorough literature review where studies related to board games developed within the scope of the 8th-grade "Principles of Ataturk and History of Turkish Revolution" course were examined. This step aimed to identify existing research gaps within the relevant literature. Afterward, the content and strategies of the question cards related to the board game to be used in the research were developed by the group members with the brainstorming technique, and it was aimed to create both reinforcing and entertaining educational material containing history information, luck factor, and motor skills. To develop these activities and strategies, the 8th-grade "Principles of Ataturk and History of Turkish Revolution" curriculum, objectives, skills, and values were examined. The goal is to encourage students to think in terms of factual knowledge and facilitate their historical thinking by utilizing skills such as critical thinking, questioning,

strategic thinking, establishing cause-and-effect relationships, and connecting the past with the future. The question cards, strategies, and the theme of the game were prepared in a way that both serves an educational purpose and stimulates curiosity, and they were presented to three experts for their opinions. After obtaining expert opinions, necessary adjustments were made, and moving on to the second phase, the board game designed for history education was first implemented in a pilot group before being applied to the target group by the group members.

After conducting a trial of the game with the group where the pilot implementation took place, based on the feedback from the players and expert opinions, the logic of the game's progression, the geometry of the game board, the content of the questions in the game, and the levels of difficulty were improved. In its initial design, the player's progression through the game was achieved by randomly navigating through complexly arranged stations on a rectangular game board. In this design, the number of stations players visited was determined by chance, leading to variations in the number of stations each player encountered, so players did not progress according to a specific plan. For the game to be beneficial, the group members decided that each player should visit an equal number of stations. Accordingly, a specialized design algorithm was developed in the background to ensure players could visit the same number of stations evenly. After the game production, this design was tested to identify potential theoretical and overlooked errors, providing a thorough evaluation. In line with the change in the game's logical progression, the game board's geometry was also revised to a circular format. After the questions initially prepared for the game were played by the pilot test group, the feedback from players and expert opinions were considered. Based on this feedback, the content and difficulty levels of the questions were redeveloped to encompass each topic and level. Upon the initial design of the game, deficiencies were identified in the dimensional parameters of the design, such as font sizes, station dimensions, dimensions of figures used within the game, and the width of the game board, as the game had not been produced previously. Following the received feedback, these physical parameters of the game were redesigned and finalized to be ready for the target group, resulting in its ultimate form.

Design Process and Utilized Applications

The "Tarih Arenası" board game includes a game board, progression pawns, figurines used as currency, question cards, dice, a toy trebuchet, and a castle. During the design of the game board and the castle used in the royal task, rough sketches and drafts were created, and until

the final design was reached, "AutoCAD" was used for vector drawings, "Paint3D" for some 3D visual adjustments, and "Adobe Photoshop" for the final design. In designing the Chance cards, Battle Arena cards, and Individual question cards used in the game, the artificial intelligence application "Midjourney" was utilized, and the final designs were achieved by editing them using "Adobe Photoshop." The central progression pawns used in the game and figurines used as currency were obtained using open design libraries and subsequently produced using 3D printers by the group members. The trebuchet and the dice used in the game were purchased ready-made. The design of the game dice has been changed to suit the game concept.

Method

Research Design

This study aimed to investigate how university students experienced the process of designing, developing, and evaluating a board game focused on imparting historical knowledge and fostering historical thinking skills within the context of the 8th-grade "Principles of Ataturk and History of Turkish Revolution" course. The design process, mechanics, and basic rules of the "History Arena" game, prepared under the TUBITAK 2209-A project, were explained in this research. Additionally, the perspectives of project participants on the game's design process and the outcomes of the pilot application were analyzed. The study was designed using one of the qualitative research methods, namely the phenomenological approach. Phenomenological research is a method that explores how individuals interpret and make sense of their individual and shared experiences. The fundamental aim of phenomenological research is to understand universal experiences by reducing them to the nature of individual experiences. Phenomenology, also referred to as phenomenological research, is concerned with examining and describing the existence and nature of events and phenomena (Tutar, 2023). In this direction, a phenomenological approach was adopted for the study.

Data Collection Tool and Implementation

As a qualitative data collection tool, focus group discussions were used. Focus group is a technique usually conducted with 4-12 participants who share common characteristics, along with a moderator, aiming to gather data by creating a multi-voiced environment where participants feel free to express their genuine thoughts without the need to conceal them

(Gülcan, 2021). In this study, the focus group technique was adopted because the aim is to learn about the participants' experiences regarding the development process of the game and to thoroughly analyze their ideas about the game. In this context, participants attempted to find answers to various questions related to the game's design and its content. The data collected in written form from the participants was subjected to qualitative analysis and organized in tables in the analysis section. The following steps are planned for the game development process in this study.

1. Session Planning: The focus group sessions' date, duration and location are determined. A quiet area was tried to be found in the school for the games, and sessions were held according to their suitability, considering the group's class hours. The tables show the sessions, durations.

Table 1 Pilot Game Playing Time

	1. Game	*2. Game*	*3. Game*	*4. Game*
Playing Time (Minutes)	74	85	88	93

2. The organization: Sessions are organized in weekly periods. According to the participants, there is no problem with the game flow. However, the participants stated that it was necessary to find quieter areas for the game and that their attention was very distracted during the game. Information about the game's playing time is as seen in the table. The second table shows the "random arrival frequency of cards". Participants played the game four times and the distiribution of cards showed below.

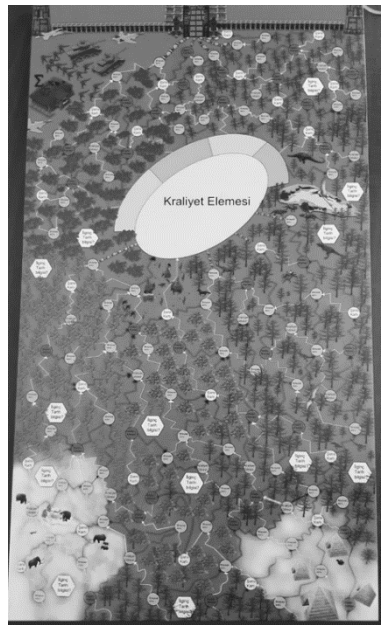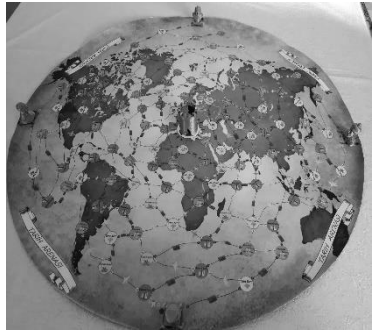*Tablo 2 Pilot Application Random Arrival Frequency of Cards in the Game*

	1. Game	*2. Game*	*3. Game*	*4. Game*
Royal Quest	11	3	6	6
Individual Question	43	36	34	38
Battle Arena	16	22	23	20
Chance Card	16	14	18	16

Results

After attending the game sessions in the mentioned periods, the participants offered their criticisms and suggestions about the problematic aspects of the game. These suggestions were opened for discussion within the group. The team involved in the game's development process made changes to the game's design process by consulting expert opinions based on these criticisms and suggestions. This section contains long reports and details. Since it cannot be given in its entirety in this study due to word restrictions, it can be forwarded to those who want to learn by e-mail if desired.
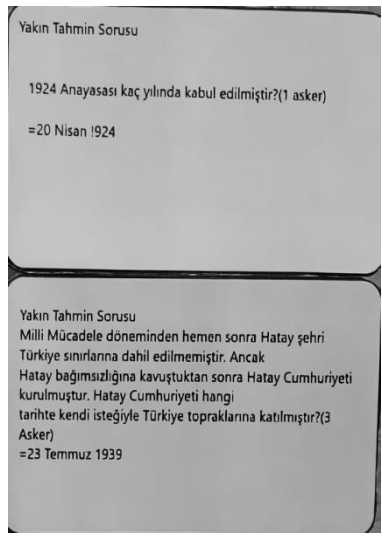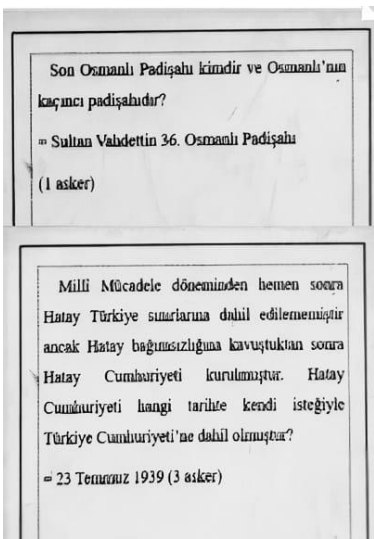
One of the changes made after the pilot application of the focus group is related to the game board. Participants stated that there were flaws in the design of the game's first version. For this reason, a significant change has been made in the game's design. This change can be seen below.

Picture 1 Pre- and post-implementation picture of the game called Tarih Arenası

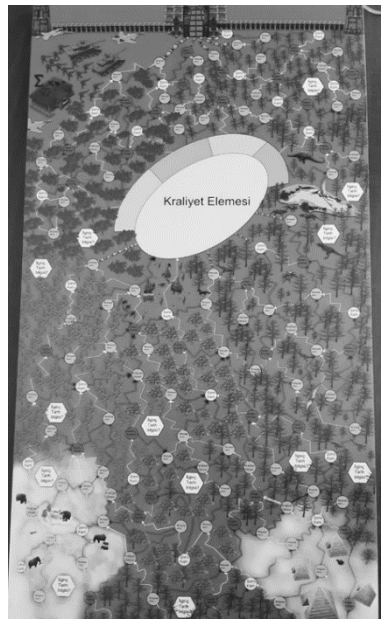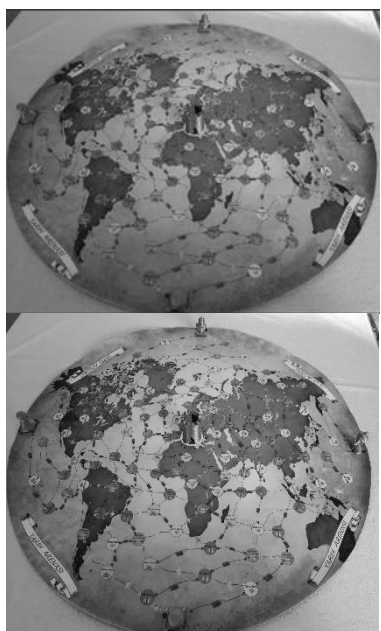| *Pre-application image*	*Change made*	*Picture of the final version*
	The progress logic of the game and the geometry of the game board have been changed.	

As seen in the photo, the layout of the game, which was planned on a rectangular ground in the first version, is on a spiral plane in the second version. According to the suggestions from the participants and the decisions taken as a result of the discussions of the game design team, a large-scale change was made in the game's geometry.

Picture 2 Pre- and post-implementation picture of the game called Tarih Arenası

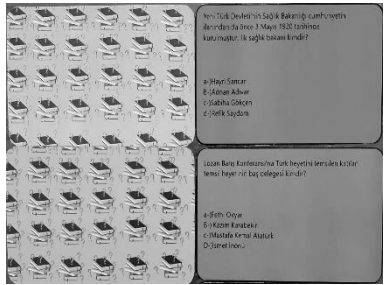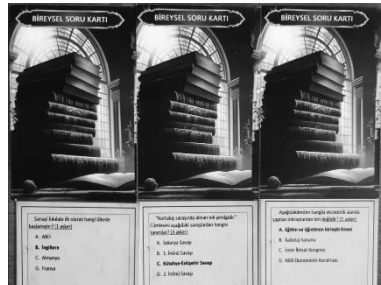| Pre-application image	Change made	Picture of the final version
	The content and difficulty levels of the questions in the game have been changed.	

According to the suggestions from the participants and the decisions taken as a result of the discussions of the game design team, some of the questions were changed.

Picture 3 Pre- and post-implementation picture of the game called Tarih Arenası

Pre-application image	Change made	Picture of the final version
	A special design algorithm has been created in the background so that players can visit an equal amount of stations.	

As seen in the photo, a special design algorithm has been created in the background so that players can visit an equal amount of stations.

Picture 4 Pre- and post-implementation picture of the game called Tarih Arenası

Pre-application image	*Change made*	*Picture of the final version*
	Fonts and font sizes have been changed.	

As seen in the photo, according to the suggestions from the participants the fonts, font sizes have been changed. Also added some art and color.

Discussion

It is known that the present generation has new learning needs, and there is a need to develop new learning techniques accordingly. In history teaching and educational sciences within the scope of social studies education, the game-based learning method comes across as an effective methods. Within the scope of the relevant literature, it is observed that the number of games designed for the achievements of the history course curriculum in Turkey is quite limited at the same time as the number of studies conducted on the subject (Aydoğan & Karabağ, 2020). This research aims to investigate how university students experienced the process of designing a board game on the topic of history education and to design, develop, and evaluate a board game aimed at providing middle school students with historical knowledge and historical thinking skills in the context of the 8th-grade "Principles of Ataturk and History of Turkish Revolution" course. With this study, a game that contains information for this course and impacts historical thinking skills was designed. Other studies in the literature aim to facilitate learning and make the course enjoyable. In studies related to teaching through games, a positive increase in knowledge retention has been observed (Korcu, 2019). Rajkovic et al. (2019). Explored the use of board games as educational media in history teaching. As a result, board games can help

students acquire and revise knowledge from a new perspective. It is known that history lessons are suitable for the design of various games in terms of content. There are games designed for different lessons other than history lessons. These studies also support that games are instructive. For instance, Kevin et al., (2021) stated that board games can be used as a fun and cooperative way to improve English proficiency in students. According to Higgins & McFeetors (2019), board games can act as pedagogical pivots for STEM teaching and learning, offering unique learning experiences beyond cognitive destinations. Ju et al (2019) also provide that educational board games positively affect students' learning motivation and performance. As supported by these studies, it has been seen that designing an alternative learning tool in courses is instructive, can provide some skills, and is a critical teamwork task. Although it has such significant benefits, it is known that it also brings with it some problems. Some problems may arise due to the distribution of responsibilities in teamwork. Since game design carries a large workload, there may be problems with time. These problems also occurred in this study, but these problems were tried to be solved in team meetings.

Conclusion

The findings obtained in the research revealed that there were various challenges in the design process of the game named "Tarih Arenası- History Arena." Changes were made regarding the design and content of the game, and revisions were implemented concerning the mechanics and strategy of the game as a result of the pilot application. The students participating in the game design project, coming from different fields and departments, contributed positively to the design process of the game. The collaboration of various disciplines in a brainstorming environment was observed to have positive effects on the design process. The division of tasks and teamwork were found to be beneficial. The participants' opinions occured on the notion that considering both educational and design-oriented aspects facilitated the design process. The findings obtained in the research have provided solutions to the challenges that may arise in designing a board game for history education. Interdisciplinary collaborations have led to positive outcomes and contributed to the field by offering insights for future endeavors.

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