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Learning Through Games in Architectural Education: Urban Architecture and Stakeholder Opinions

Abstract: - Game-based learning methods in architectural education not only enable students to learn effectively, but also increase their motivation by making the subjects more interesting. Obtaining stakeholder opinions during the design phase of buildings that are important in the city skyline is a method applied in many countries. A game was organized on this subject for Akdeniz University Architecture students, who will be the architects of the future, within the scope of obtaining the opinions of stakeholders in the design of architectural structures that affect the city skyline at important points in Antalya, which is a tourism city. In the game, students are divided into stakeholder groups such as architects, municipal officials, tourism representatives, public representatives, professional chambers, environmental protection association representatives, and each stakeholder will bring suggestions according to their own perspective through the selected regions. A game design that includes the opinions of the stakeholders in the study can improve students' ability to look from different perspectives, increase their professional communication skills, and provide students with an interactive learning experience. This game aims to develop a culture of cooperation and consensus by bringing together different perspectives of stakeholders. It also aims to raise awareness about the process of designing the colorful structures of Antalya city and to provide experience to the participants.

Keywords: Antalya, Architecture education, stakeholder, game based learning, urban silhouette.

I. INTRODUCTION

In architecture, the issue of how new constructions affect contemporary structures in the historical environment and approach areas is an important issue that must be balanced with the understanding of contemporary architecture by preserving the urban character and identity. It is important that new buildings built in historical environments reflect the spirit and character of that region. However, contemporary architecture can also create a balance between the historical environment and modern buildings by bringing a different perspective to the urban identity. This balance can enrich the city's identity and make it sustainable by building a bridge between the past and the future. Thus, the aesthetic and functional contribution of new construction in the historical environment to the city can have a positive impact on urban development in the long term.

With this comprehensive aspect, architectural education can be evaluated differently from all other disciplines. Although architecture faculties are departments that accept students based on science scores, they are also closely related to social sciences such as law, sociology and art. Therefore, both the professional practice of Architecture and the theory of Architecture require interdisciplinary cooperation and comprehensive thinking abilities, as well as technical knowledge requirements. Architecture, which also has the art and practice of designing and constructing buildings and the physical environment, aims to produce technical, functional and aesthetic designs, defined as the 'science of science' (Hasol, 1993). In this regard, the individual must have collaboration skills and creativity, as well as competence in technical and numerical fields. The act of architecture is inherently intertwined and includes design, construction and use processes. These processes take place around certain legal regulations and sensitivities, and each process involves different actors. In order to produce and implement a successful architectural design, architectural designers must master these processes and carry out their designs in cooperation with different actors. For this reason, it is very important to gain these sensitivities in architectural education. Learning and innovation skills such as creativity, collaboration, communication and critical thinking, which are commonly defined as 21st Century skills (Binkley et al., 2014), and the use of information and media technologies are of critical importance for the profession of Architecture. The development of 21st century skills is attracting more and more attention from both researchers and educators at all education levels, starting from primary school (Chan & Yuen, 2014).

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There are many courses in architectural education that encourage students to look from different perspectives. Courses such as contemporary design in the historical environment, zoning regulations, construction management, and urban design projects aim to provide Architecture students with the skills to question from different perspectives while designing. However, for students who are just developing their technical skills, grasping these perspectives is not as easy as it seems. Therefore, traditional education methods are not sufficient to provide these skills. The fact that architectural education is a relatively new field of education gives rise to many discussions about the education model. For this reason, traditional education models create contradictions between professional practice and architectural theory and create difficulties that architects experience in their professional lives (Walsche, 2017). It would be beneficial to reconsider traditional education methods in the education of children who are born and raised in an environment surrounded by high-tech devices. The changing social structure and changes in technological tools over time require some transformations and changes in education models in order to provide students with 21st Century skills. Games in which students can develop empathy by adopting different roles so that they question their designs from different perspectives can be effective in gaining these skills.

Play, the most basic teaching tool of childhood, is a concept that adults are not unfamiliar with. Play is 'a form of self-expression' and 'a link between imagination and reality'. It has been described as a "bridge" (Ormanlıoğlu, 1999). Playing games, which is a universal concept, is a universal phenomenon that does not recognize any national or cultural limitations. As a concept that appeals to different age groups in different ways, it is a very effective tool in terms of physical and psychological development (Fanusçu, 1994). In game learning models, where education is made more fun through experience, students' participation and interest in the lesson is increased. In addition, teamwork, creative solutions, risk management and critical thinking skills are also developed (Adipat et al., 2021).

Game-based learning and gamification methods are very effective tools in this regard (Liu et al., 2020). Research on education shows that there is an increasing trend towards game-based learning models. (e.g., Ke, 2009; Kebritchi, Hirumi, & Bai, 2008; Wu, Chiou, Kao, Hu, & Huang, 2012). Game-based learning describes an environment where game content and game play enhance knowledge and skill acquisition and game activities include problem-solving areas and challenges that provide players/students with a sense of accomplishment (Kirriemuir & McFarlane, 2004). In the design of educational games, game design strategies are followed with different tools and methods depending on the type of knowledge and skills that are desired to be imparted to the student (Pivec et al., 2003). Among these game types, Co-op, role-playing, narrative, exploration and complexity are the most popular game design elements. Studies mainly focus on gaining critical thinking and collaboration skills (Liu et al., 2020). Game-based learning models, which are used in different educational fields such as language learning, Mathematics, Science, Social sciences, Business management and give successful results, are also used effectively in architectural education. For example (Çekmiş & Karakaya, 2024), first-year architecture students achieved significant gains in the development of their visual design skills with the game they used in basic design education. (Shafei, 2019)'s experimental research with architecture students also showed that game-based education positively affected students' motivation, participation, and their views on the benefits of the course. The results of research on game-based education in both architectural education and other scientific fields show that these methods support students' motivation and learning skills.

In our research, fourth-year architecture students, who were given a project on contemporary design in a historical environment, were asked to evaluate the project from the perspective of the stakeholders involved in the implementation of the project by adopting different roles regarding the impact of the contemporary structure on the city and especially on the city's silhouette. Students were first informed about the role of the stakeholder and the relevant legal regulations, the nature and importance of the role they assumed, and then they internalized these roles and evaluated the projects within the framework of certain principles and critical questions. This phase of the projects was gamified, aiming to intensify students' interest and understand the effects of the roles they undertake on the design. Our main aim in the game, which we designed by including different processes and actors of the architectural act, is to help students understand the legal, environmental, economic and social impacts in architectural design and urban planning processes and to grasp the depth of these processes. Thus, it is aimed to ensure that they understand the importance of the professional responsibility they undertake and develop a participatory design approach by taking into account the perspectives of different stakeholders within their professional practice.

II. Materials And Method

Antalya is a historical and touristic city located on the Mediterranean coast of Turkiye. One of the most important and touristic areas of Antalya is Kaleiçi. Kaleiçi is known as the historical center of Antalya and impresses its

visitors with its narrow streets, Ottoman-era houses, colorful flowers and charming atmosphere. The city also attracts attention with its historical buildings. Historical buildings such as the Yivli Minaret, Hadrian's Gate and the Clock Tower in the Kaleiçi region reflect the rich cultural heritage of Antalya. Antalya, and especially Kaleiçi, is one of the most popular tourist destinations in Turkiye with both its historical and natural beauties. The areas given to the students as project region are the areas adjacent to Kaleiçi, called Haşimişcan and Hanlar, seen in Figure 1.

In order for different stakeholders to evaluate the design decisions from their own perspectives in the game, the designs of the students in the Haşimişcan and Hanlar regions (Figure 1) were selected within the scope of the Akdeniz University, Department of Architecture, Architectural Design VII course.

Figure 1. Location of Architectural Design VII project study areas near the Kaleiçi "HANLAR and HASIMISCAN"

In this game is an educational tool designed to enable architecture students to evaluate the architectural project of this term's new design in the historical environment from the perspectives of different stakeholders such as "architects (designers), local government representatives, tourism representatives, environmental protection associations". Each student, assuming the role of each different stakeholder, answers the questions given to him/her for the two selected projects in the online survey by looking at the pictures projected on the wall in the classroom. Additionally, stakeholder groups hold discussions among themselves.

The aim of the game is for students to learn to think multifacetedly in design processes, to better understand the needs of various interest groups and their impact on the project. This process develops discussion and negotiation skills by considering issues such as sustainability, social impact, economic benefit and environmental protection.

In the game, a project is basically determined and discussed by different representative commissions within the framework of certain principles. These commissions then come together and carry out a reconciliation process and try to develop the most ideal proposal for each segment that will be affected by the project.

Each stakeholder identified in the game has a unique perspective and goal. Four different role definitions and a commission determined for each role will make their evaluations with the following roles and basic perspectives.

a) Municipal authority: Infrastructure, transportation, urban plan, compliance with local and national regulations.
b) Architect (designer): Aesthetics, functionality, sustainability and durability
c) Tourism representative: Evaluating the tourism potential of the region and structure and integrating the project into the environment and commercial infrastructure
d) Conservation of the historical and natural environment protection association: Ensuring the protection and sustainability of cultural heritage, natural areas and historical environment

Each commission and also each student as personally evaluated the project and design decisions for compliance with the following principles;

Municipal official evaluation form:

1. The project complies with the municipality's current development plans.
2. The project makes positive contributions to the existing use of urban areas.
3. The project is suitable for the urban texture and architectural style of the region.

4. Existing infrastructure (water, electricity, sewage, communication) systems are sufficient for the project.
5. The transportation infrastructure and traffic density of the region are suitable for the implementation of the project.
6. The capacity of existing social facilities (schools, hospitals, sports facilities, etc.) is sufficient for the project.
7. The project has positive effects on the long-term urban and commercial development of the region.
8. The project does not harm green areas and the environment. (Air, noise and environmental pollution, etc.)
9. Necessary security measures have been taken in the project against earthquakes and other natural disasters.
10. The project poses a threat to risky areas or dangerous structures in the region.

Architect (designer) evaluation form:

1. 1.The design of the project is sufficient in terms of aesthetics, functionality and sustainability.
2. The architectural style and principles adopted in the design are compatible with the urban and natural environment.
3. The project is compatible with the existing historical buildings and urban fabric in its surroundings.
4. The project provides functionality to meet the needs of its users and considers the needs of different user groups (elderly people, children, disabled individuals).
5. The mass of the building, façade design and material selection have a positive impact on the city silhouette and urban space.
6. The building is adequate in terms of natural light and ventilation.
7. The project is designed to positively affect the social life of the local people.
8. The project is sensitive to the protection or development of cultural heritage.
9. The project complies with the zoning plan and other legal requirements (height limits, density, parking requirements, etc.).
10. Relevant engineering requirements (fire safety, earthquake regulations, etc.) have been considered in the design.

Tourism representative evaluation form

1. Considering the existing touristic areas, cultural and natural riches, the region where the project is located is touristic attractive and has significant tourism potential.
2. It is suitable for special events, tours or services to be offered to tourists.
3. The transportation infrastructure of the project is convenient for tourists to access the historical and commercial areas of the city.
4. The location of the project is sufficient for public transportation, vehicle roads and other transportation options.
5. The integration of local businesses such as hotels, restaurants and other tourist services around the project with tourism is sufficient.
6. The project will have a positive impact on the local economy and employment.
7. Tourism revenue will create employment opportunities and new opportunities for local businesses.
8. The project preserves ecological balance and supports local culture.
9. The project may reflect local cultural heritage and traditions. For example, it can enable cultural events that introduce Turkish cuisine, Turkish music and local handicrafts to different societies.
10. The project is in a location where security and health services can be easily provided to tourists.

Historical and natural environment protection association representative evaluation form:

1. The project has a design that is compatible with the historical and natural environment.
2. The project does not endanger the existence of natural and historical elements in its surroundings.
3. The project is compatible with local cultural values and architectural heritage.
4. The project ensures the continuity and support of cultural events.
5. The project does not have negative effects on the flora and fauna in the natural environment.
6. The project does not harm the ecological balance.
7. Necessary measures have been taken to protect and increase green areas in the project.
8. Necessary sustainability measures have been taken in the project regarding energy efficiency, material selection and waste management.

9. Necessary measures have been taken to minimize the environmentally damaging effects of the project (air, environment, noise pollution, etc.).
10. The project complies with local and national cultural heritage and environmental protection laws.

III. Results And Discussion

In the project titled 'Contemporary Project Close to Kaleiçi Historical Urban Areas' given to the students of the Architectural Design course of the Akdeniz University Faculty of Architecture, Department of Architecture, while the design processes of the students were continuing, the suggestions shown in Figure 2 and Figure 3 were selected and the students were asked to evaluate them within the scope of the roles they assumed. Students were asked to examine the class of city skyline whose current and proposed states were shown in the pictures.

The scenario of the project requested within the scope of the given course is as follows;

*The explanation of the lesson praise given is as follows. *Design is expected to be considered in integrity with the environment on an urban scale and developed with an understanding that increases urban quality and interior-exterior integrity. *In line with the design decisions justified within this framework, all buildings located in the given area as of September 2024 will be analyzed and evaluated, and if necessary, they may be eliminated (except for registered buildings, if any). * In the new buildings to be designed, it is expected that housing, commerce, tourism-accommodation functions will be handled in a mixed manner and together with parking lots and green areas, in order to improve and enrich urban life and culture. * Building density in the design area, including protected structures, will be accepted as E= 0.80 (+-5%).*

Photographs of particularly controversial project proposals were projected on the presentation screen and presented to the students, and the students evaluated the proposed projects by answering the test questions determined within the scope of their roles in the first stage. In the second stage, the groups formed by the students were asked to discuss the proposal projects among themselves, from the perspectives of their roles, and agree on a design that all roles could accept. The evaluation results of the students are as seen in Figure 4-7. The results of the evaluations of the project proposals are generally parallel.

Looking at the results of the online survey in the classroom environment, similar percentages were observed for Figure 2 (proposal 1) and Figure 3 (proposal 2). In other words, the municipality does not like what the designer does not like, but only the percentage of liking changes. However, considering that the general purpose of the study is to raise awareness among students, this is not much of a problem in terms of the purpose of the study.

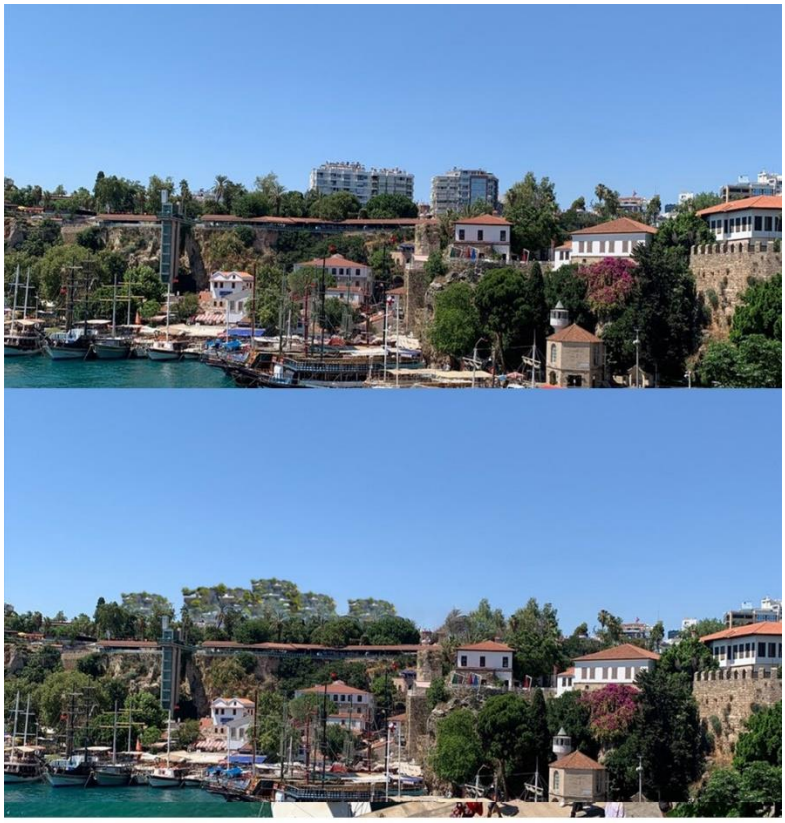
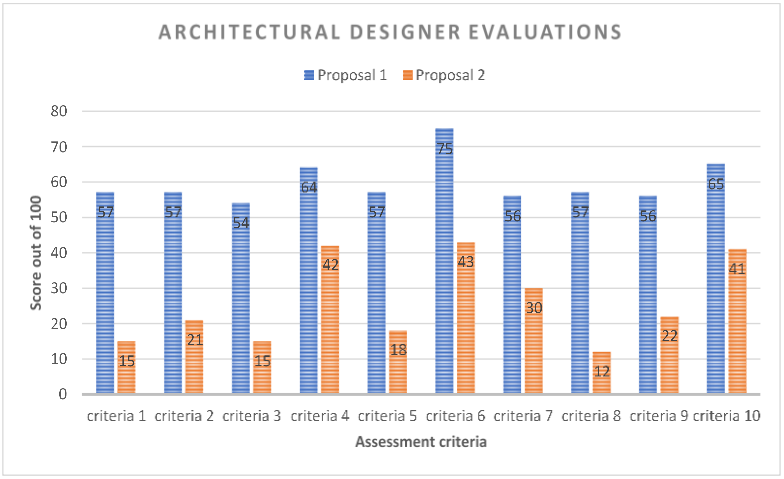


Figure 2 The selected project prepared for the Hanlar District silhouette (existing above, proposed status below). **Proposal 1.**

Figure 3. The selected project prepared for the Hasimiscan District silhouette (existing above, proposed status below). **Proposal 2.**



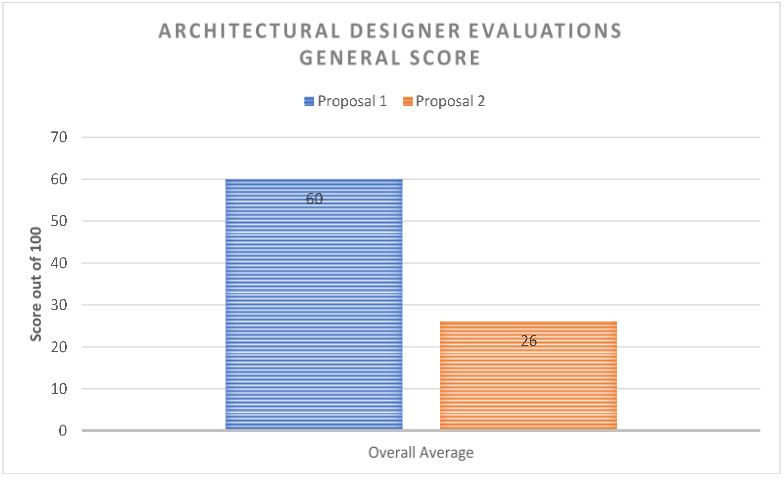
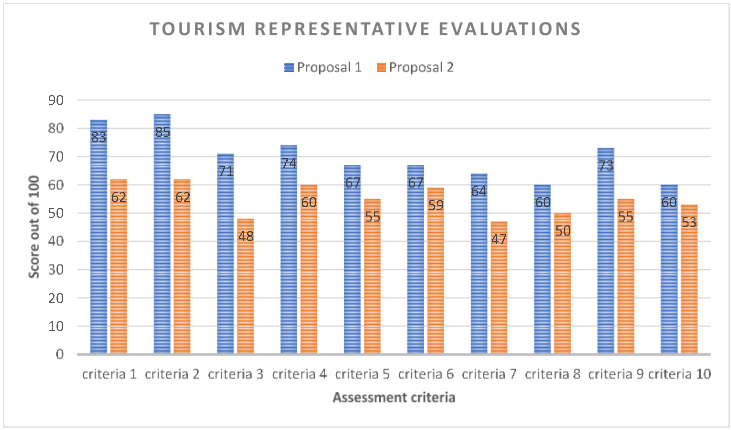


Figure 4. Evaluation results from the perspective of the designer architect.



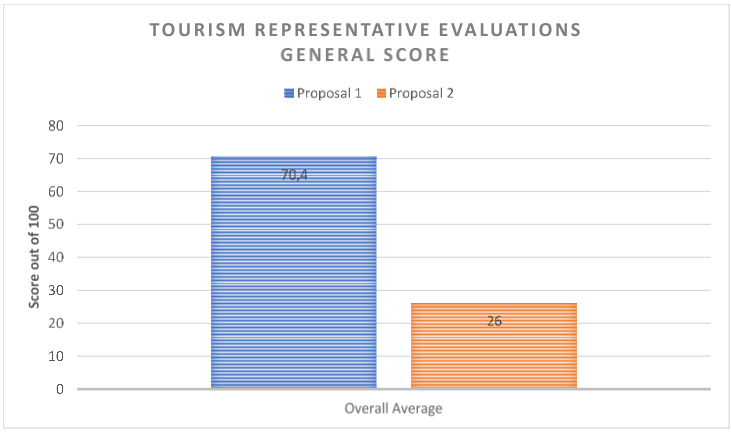
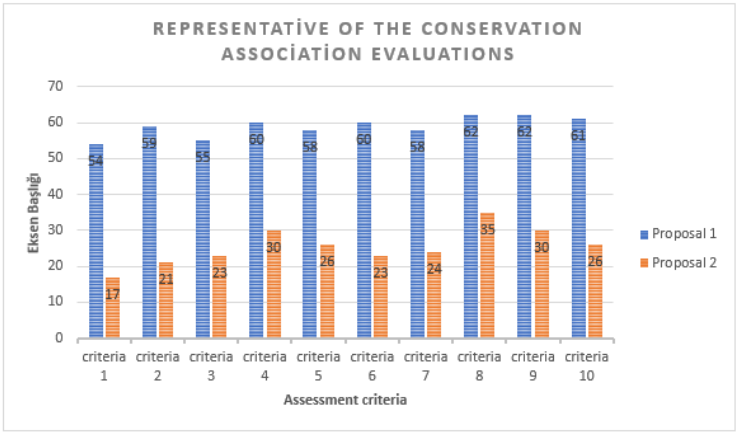


Figure 5. Evaluation results from the perspective of the tourism representative.



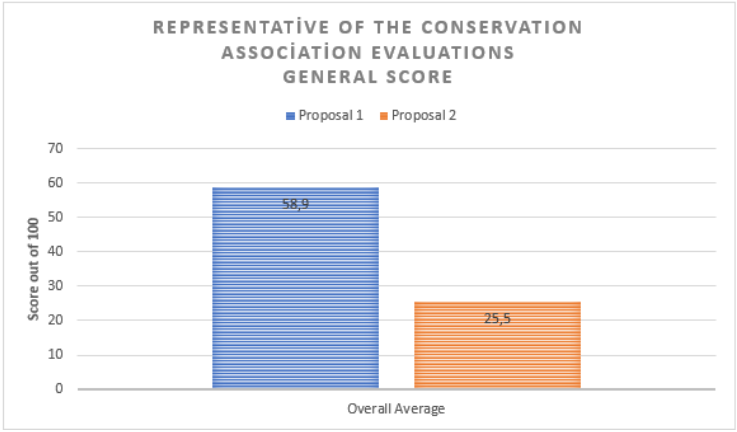


Figure 6. Evaluation results from the perspective of the representative of the conservation.

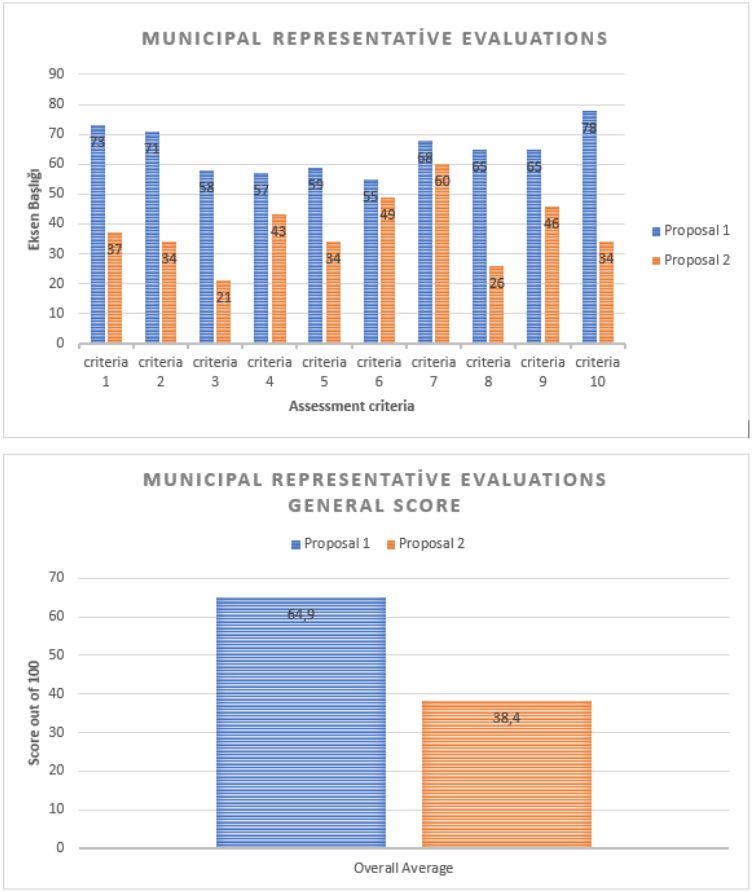


Figure 7. Evaluation results from the perspective of the municipal representative.

IV. Conclusion

When the evaluation results of the students were examined as research findings, the scores determined by the different roles for Figure 2 (Suggestion 1) and Figure 3 (Suggestion 2) showed parallelism (in favor of Proposal 1). Figure 4-7 shows the scores (above) consisting of the responses of different roles to certain evaluation criteria and the general evaluation scores created by these scores. According to these evaluations, the evaluation results of different roles for proposal-1 and proposal-2 are as follows: Architectural Designer: 60-26, Tourism Representative 70.4-26, Conservation association representative: 58.9-25.5, Municipality Representative: 64 ,9-38,4. According to the results of this evaluation, Proposal 1 received the highest score from the Tourism representative (70) and the lowest score from the Conservation Association representative (58.9). The Second Suggestion received the highest score from the Municipality representative (38.4) and the lowest score from the Conservation Association representative. It is noteworthy that both project proposals received the lowest score from the conservation association representative.

In the evaluation made by each different role, a significant score difference was observed between the two proposed projects. Proposal project 1 has a structure that spreads over larger areas and is relatively compatible with the green texture of the city. Proposal project 2 has a multi-storey structure that occupies less space. In the evaluations made by the students by assuming different roles, the fact that both projects received the lowest score from the Preservation Association role is due to the difficulty of a contemporary building built in a historical environment to harmonize with the rest of the city. The fact that Proposal 1 received the highest score from the Tourism representative role can be explained by the fact that the touristic and commercial potential created by the proposal overrides environmental sensitivities. The fact that Proposal 2 received the highest score from the role of the Municipality representative shows that the legal processes in the execution of architectural designs are not strongly associated with environmental and aesthetic concerns.

Understand the roles of stakeholders: Experiencing the perspectives of different stakeholders such as actors, architects, municipal officials, tourism representatives, public representatives and representatives of the environmental protection association, understanding the contributions and sensitivities of each to the project.

Comprehension of decision-making processes: Developing students' interdisciplinary thinking skills by representing complex decision-making processes in real life

Developing critical thinking and problem-solving skills: Encouraging students to evaluate projects and proposals with a critical eye, so that they learn to analyze the strengths and weaknesses of projects according to the criteria of different stakeholders. In this way, they develop skills in producing creative and innovative solutions within different needs and goals.

The personal orientations of students who have received a certain education are also shaped within the framework of this education. Therefore, it is inevitable for architecture students who undertake certain roles to make decisions with the sensitivity that comes from their architectural education in their evaluations. If students from different educational fields undertake different roles in such a study, it is inevitable that different results will emerge; For example, very different scores can be obtained if Business Management or Tourism faculty students take on the role of Tourism representative, or if Law faculty students take on the role of municipal representative. However, the aim of this study is to enable students to learn through play experience the processes through which decisions taken in architectural professional practice go through and what sensitivities should be observed.

The main purpose of the research is to ensure that students achieve the following achievements rather than which picture gets the most likes.

Understanding the roles of stakeholders: Experiencing the perspectives of different stakeholders such as actors, architects, municipal officials, tourism representatives, public representatives and environmental protection association representatives, and understanding the contributions and sensitivities of each of them to the project.

Comprehension of decision-making processes: Improving students' interdisciplinary thinking skills by representing complex decision-making processes in real life

Developing critical thinking and problem-solving skills: Encouraging students to evaluate projects and proposals with a critical eye, so that they learn to analyze the strengths and weaknesses of projects according to the criteria of different stakeholders. In this way, they develop their skills in producing creative and innovative solutions within different needs and goals.

Developing awareness of historical and natural environmental protection: Students develop a sustainable understanding of architecture by understanding the effects of architecture and urban planning processes on the historical and natural environment, with the information they acquire about architecture and urban planning principles during the game process.

Developing social and national awareness: To help people understand the importance of local history, cultural heritage and social values by understanding the interests, needs and wishes of the society. In addition, to develop skills in making design decisions that can contribute to the national economy.

Developing legal and ethical awareness: Informing and raising students' awareness on issues such as local and national laws, regulations, historical and natural environmental protection laws.

Developing communication and collaboration skills: Developing a consensual design approach and communication skills in collaboration by exchanging ideas with different stakeholders.

Developing problem-solving skills: Developing students' problem-solving skills consciously by understanding the perspectives and sensitivities of different stakeholders.

For these purposes, it has been tried to provide architecture students with an infrastructure to become professionals who can evaluate architectural projects not only in terms of design, but also from social, environmental and economic perspectives, manage collaboration processes, develop strategies, have extensive problem-solving skills and make conscious decisions.

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