



Use of Turkish Mythology as a Design Variable in Product Design

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ABSTRACT

In this article, a comprehensive education model has been implemented in the Wooden Toy Design (WTD) course of Interior Architecture and Environmental Design Department at Kırıkkale University in Turkey. This course is an obligatory course for second year students enrolled in the department. The course was carried out in the Spring term of 2020-2021 educational year. Although pandemic conditions dictated that all education had to be done in on-line classes, this seemingly disadvantage had been overcome in the process. Among 78 students enrolled for the course, 47 students managed to satisfy necessary conditions and to make submissions.

Various researches point out the advantages of using hands-on education approaches in interior architecture education. WTD (Wooden Toy Design) course has been deliberately positioned by the instructor in the manner to serve as a laboratory for students to experiment on real life needs and solutions. In fact, the design problem has been planned to simulate a fictional need for a toy to be designed having Turkish mythology as a design criteria and the material would mainly be of wood. Within the scope of the course, toy design has been enriched with necessary studies on Turkish mythology. Students have well spent their time researching, designing and commissioning their designs to workshops within a single term of their education period.

The article concentrates on quantitatively assessing advantages of hands-on learning principles implemented within the framework of the course. Students were requested to research Turkish mythology, devise characters, make necessary technical drawings and the commission workshops to prepare their designs. An anonymous survey consisting of 30 questions was used to collect data on jury day from students. Descriptive statistics have been used to analyze research results.

The rich content of Turkish mythology has been useful in both character creation and in forming strong cultural bonds. Students have had the chance to experiment with real materials, details and finishes. Two toy designers have given seminars online and have further contributed to the education process with their presence in the final jury. Students have encountered and mastered various problems and have gained invaluable experiences via the course. The experience gained from researching, designing, commissioning and finally delivering a proposal is important as this cycle closely resembles the works of nearly every professional interior architect.

Keywords: Interior architecture, Product design, Toy design, Turkish mythology, hands-on learning, education

Ürün Tasarımında Tasarım Değişkeni Olarak Türk Mitolojisinin Kullanımı

ÖZET

Bu makalede, Türkiye'de Kırıkkale Üniversitesi İç Mimarlık ve Çevre Tasarımı Bölümü Ahşap Oyuncak Tasarımı (AOT) dersinde kapsamlı bir eğitim modeli uygulanmıştır. Bu ders, bölüme kayıtlı ikinci sınıf öğrencileri için zorunlu bir derstir. Ders 2020-2021 Eğitim-Öğretim yılı Bahar döneminde gerçekleştirilmiştir. Pandemi koşulları tüm eğitimin online



imkanlarla yapılmasını zorunlu kılsa da bu dezavantaj süreç içinde aşılmıştır. Kursa kayıt yaptıran 78 öğrenciden 47'si gerekli koşulları sağlamış ve teslimlerini gerçekleştirmiştir.

İç mimarlık lisans eğitiminde uygulamalı eğitim yaklaşımlarının kullanılmasının avantajlarına çeşitli araştırmalarda işaret edilmektedir. AOT (Ahşap Oyuncak Tasarımı) dersi öğretim elemanı tarafından bilinçli olarak öğrencilerin gerçek yaşam ihtiyaçları ve çözümleri üzerinde deney yapmaları için bir laboratuvar işlevi görecektir şekilde konumlandırılmıştır. Tasarım problemi, tasarım kriteri olarak Türk mitolojisi temel alınarak tasarlanacak bir oyuncak için kurgusal bir ihtiyacı simüle etmek üzere planlanmıştır. Kullanılacak malzemenin ağırlıklı olarak ahşap olması planlanmıştır. Ders kapsamında oyuncak tasarımı Türk mitolojisi üzerine gerekli çalışmalarla zenginleştirilmiştir. Öğrenciler, eğitimlerinin tek bir döneminde; araştırma yapmak, tasarım yapmak ve tasarımlarını atölyelerde imal ettirmek iş modelini başarı ile tamamlayarak zamanlarını verimli kullanmışlardır.

Makale, ders çerçevesinde uygulanan uygulamalı eğitim ilkelerinin avantajlarını nicel olarak değerlendirmeye odaklanmaktadır. Öğrencilerden Türk mitolojisini araştırmaları, karakterler oluşturmaları, gerekli teknik çizimleri yapmaları ve tasarımlarını atölyelerde yaptırmaları istenmiştir. Jüri gününde öğrencilerden veri toplamak için 30 sorudan oluşan isimsiz bir anket kullanılmıştır. Araştırma sonuçlarını analiz etmek için tanımlayıcı istatistik yöntemleri kullanılmıştır.

Türk mitolojisinin zengin içeriği hem karakter oluşumuna hem de güçlü kültürel bağlar kurulmasına yararlı olmuştur. Öğrenciler gerçek malzemeler, detaylar ve son kat cila malzemelerle deney yapma şansına sahip olmuşlardır. İki oyuncak tasarımcısı çevrimiçi olarak seminerler vermiş ve final jürisinde yer alarak eğitim sürecine katkı sağlamışlardır. Öğrenciler çeşitli problemlerle karşılaşmış, bunları aşmış ve ders boyunca paha biçilmez deneyimler kazanmışlardır. Araştırma, tasarım, sipariş verme ve nihayet teslimden oluşan modelden elde edilen deneyimin önemi büyüktür, zira bu model neredeyse her iç mimarın profesyonel çalışmalarına çok benzemektedir.

Anahtar Kelimeler: içmimarlık, ürün tasarımı, oyuncak tasarımı, Türk mitolojisi, yaparak öğrenme, eğitim

1. INTRODUCTION

How can one relate to the use of out of date even ancient knowledge while attempting to engage in an activity that is so contemporary and new such as the design of a new object? The necessity of this article has exactly been to report such a contradiction. A field study was carried out by C. M. Charles in 1964 to identify various learning disabilities for Native-American children. The study had been conducted to determine the cultural and belief-based obstacles that posed problems for Native-American children in learning scientific knowledge. The field study was executed in 5 primary schools in which Native-American students attended and who were determined as the study group. A control group was formed from Anglo-origin students attending to the same schools. According to the first hypothesis of this study, Native-American children in the sample are incompetent' in learning basic scientific concepts. Additionally the second hypothesis stated that the reason for these children's backwardness in learning scientific facts had been due to their commitment to their traditional and mythological heritage. In the light of current knowledge, what achievements have we exactly accomplished in the 6 decades that have passed?

It is with great relief and satisfaction that academia has reached a verdict supporting the thesis that cultural and mythological heritages of societies do not at all constitute any obstacles to teaching scientific principles. Today, the efforts in the field of cultural heritage have been summarized as 'Increasing efforts to protect and preserve the world's cultural and natural heritage' (<https://turkey.un.org/tr/sdgs/11>) under the title 11.4 among the United Nations' Sustainable Development 2030 objectives. Within ongoing studies in



relation to this context, the undiminished importance of various cultural heritage is currently being praised and emphasized.

Culture includes many physical and conceptual elements such as knowledge, beliefs, behaviors and physical objects related to these concepts. Language, thought, tradition, sign and communication systems of social life, institutions, laws, tools and works of art are also among these values. Culture is therefore a multidimensional concept that includes personal skills as well as social content.

Within the scope of this article, the use of Turkish mythology as a prominent cultural heritage item in product design has been discussed. The framework and results of an academic study based on hands-on learning principles will be introduced. Finally conclusive comments about the efforts in a toy design course with the duration of one academic term have been included in the article.

2. TURKISH MYTHOLOGY

The need to introduce the idea of Turkish mythology into a product design course has been the need to create designs within a specific framework thus to increase creativity. Former experiences with product design classes carried out without a specific framework have seldomly produced desired levels of creativity. As Michalko (2006) points out in his works, changing one's perspective can possibly expand the design alternatives that were not conceivable before. Due to this shift in perspective, one is now able to see something other than what everybody else is seeing. This is one of the major reasons that Turkish mythology has been presented as a design constraint. Another reason was that developments in carry-on technology have developed to a stage where the connection between history and the past is faint. Introducing mythological tales into the course could help to increase senses of attachment and awareness to Turkish origins.

The word Mythology is one that has been created and used in Anatolian culture dating back to 400B.C. introduced in the works of Plato. By definition, the word means storytelling, but the term has also been widely used for myth studies. Myth studies are -technically speaking- a serious matter. Myths include thought patterns where social groups formulate their self-awareness and self-cognition, express origin of being, define surrounding geography and try to determine destiny. Myths have inspired people to live, to die and even to kill for in order to conform their demands. Myths are timeless tales that tell 'what was' in the beginning, 'what is' now, and what 'will be' in the future. In the course of human history, societies have evolved, beliefs have been changed, several myths have been created but more have been forgotten in the process. Myths are essentially non-physical fossils of mankind's recorded history. However myths today are patient remnants of ancient tales that have been transformed from holy scripts to historical stories. Gods have changed into heroes and sacred times into a long time bygone heroic past.

It is important to know the mythologies of societies in order to understand these societies better. Myths act as clues to decipher subconscious thoughts and beliefs of societies. Turan (2020) presents a valid example for such a belief. While in the process of waking up adrenal glands release adrenaline that wakes up the brain first, then commands the body to move. Delay in this sequence of events feels as if an evil spirit pressing on one's chest to prevent breathing. In Turkish mythology this situation is believed to be caused by the evil Kara Koncolos or Kamos; whereas this occurrence is solely the result of the biochemical state of the body. The archaic societies have formed their beliefs and explained their surroundings according to a dualist perspective. Here dualities such as day-night, male-female, good-bad, hot-cold etc. have evolved in time. Societies have further begun to place descriptive meanings to their surroundings according to a quadruple item reasoning. Examples for these are, four seasons, four directions, four major colors etc. have improved the interpretation of surroundings and geographical location of each society (Bilgili, 2021). Myths contain knowledge within a certain systematic format. Ancient myths have been proven to inherit aerial or astronomical knowledge about stars and planets in the inhabited



environment. For instance research on the mythical story of Oğuz Kağan has revealed that the cosmological story had in fact contained various embedded details about the creation of the universe.

The term Turkish Mythology used in this article specifically refers to the beliefs and culture of Turks dating back to Sumer civilization that constitutes a duration of approximately 4,000 years. Mythology has been used as a practical tool for explaining and further conducting various bodies of knowledge including astronomy, geography and historical narration to following generations. Such a narration is practical, realistic and one that facilitates inductive reasoning (Ülken, H. Z., 1982).

The most important cosmology for Turks is the Sky (masculine) and Land (feminine) duality. According to Turkish myths; while all was in chaos, -in time- skies from earth, light from darkness and male essence from female essence were separated from each other. As time passed by, these dual forces which had been initially separated, started to come back together again. According to Turkish mythology, this was the time when the first humans came to life. The skies are considered to be light and of masculine character, whereas the land is dark and of feminine character. The moon is the representative of the divine masculine father and the sun is the representative of a fertile mother. These two divine forces are the mother and father of Turks according to mythology. One interesting note is about the creation of women. According to Turkish mythology, the woman (Eve) was not created from the rib of the male (Adam); but was formed by the creator as a separate and equal entity (Hatun) to the male being. Similar duality can also be found in the Chinese yin-yang symbolism. The double headed animals such as deer, birds, dragons have been used to represent such a dual symbolism. Another duality can also be found in Light (Ak) and Dark (Kara) shamans who are in contact with good and evil spirits consequently.

Shaman clothing has been reported to include certain materials such as different metals and mirrors which are thought to depict the highly valued sun, moon and Venus. Further research reveals a quadruple symbolism in Turkish mythology. Four materials –wood, metal, fire and water- have been used in relationship with four planets and also with four directions and four colors. Directions, colors and the names of associated planets are shown in Table 1:

Table 1: Directions, Colors and Planets

East	Sky-Blue	Jupiter	Planets with Good Energy
West	White	Venus / Moon	
North	Black-Yellow	Saturn	Planets with Evil Energy
South	Red	Mars	

The color blue is used to depict east direction and planet Jupiter is in this direction. The color white stands for west direction where the moon and the planet Venus is thought to be present. These planets and directions are cosmologically thought to contain good energy entities. Color yellow is associated with the ground and Saturn is thought to be placed in this direction. The color red is associated with the planet Mars. These last two planets and directions are associated with death and thought to contain various evil energy entities.

Contents of Turkish mythology containing various bodies of knowledge mentioned above have been regarded as a unique source for idea generation process in the toy design course conducted in the Department of Interior Architecture and Environmental Design at Kırıkkale University. With its rich context and variety of characters both good and evil, Turkish mythological features have offered a vast range of thoughts and alternatives to be used in the process of designing toys. The use of cultural heritage items as modern product design criteria is thought of as being an interesting and unique approach in design. This approach can provide means to incorporate and create products with distinctive identity as well as to reflect the rich contents of Turkish mythology. Overall, incorporating Turkish mythology



into product design can be a way to celebrate cultural heritage, create unique and meaningful designs, and to provide a distinctive identity to designed products.

3. WOODEN TOY DESIGN (WTD) COURSE

Wooden toy industry is reported to commission a significant amount of currency every year to several countries. Currently wooden toy manufacturers are determining the possibility of using wood wastes from urban forestry to assist in economic feasibility of the process as well as for supporting sustainability considerations (Bispo, L.F.P. et al., 2022). The case for good toy design is supported by a variety of factors. Such examples are the use of raw materials, aesthetics, function and story narration (Keneilwe, M. and M'Rithaa M. K., 2012). A major discussion related to toy design is the durability of the toys. Heljakka (2022) claims that two major topics namely; physical durability -affected broadly from the selection of materials and joint details- and the thematic durability -owning interesting backstories that invite players for long-term play- are responsible for attaining strong affective reactions towards the toy. Jiang, et. al., (2018) have acquired a quantitative approach to determining perceptual and physical expectations from toys in terms of color, material and production methods. Nagy (2015), has focused on cognitive meaning of toys rather than physical aspects that define them. Toys are supposedly harmless everyday objects that can have effects on the most complex concepts like education, socialization, consumer habits, politics and ideology. Yeh, T. L., and Chang, J. H. (2017) have adapted a qualitative analysis to state that firstly, toys have a prominent role in aiding problem-solving abilities of children and secondly, toys have both physical and psychological impacts on children affecting child motor development on the one hand and addressing cognitive and educational issues on the other.

The Wooden Toy Design (WTD) is an obligatory course for second year students enrolled in Interior Architecture and Environmental Design Department at Kirikkale University in Turkey. A total of 78 students were enrolled in the course, however 47 were able to fulfill the requirements of the course and to take part in the conducted survey. The two major aims of the WTD course can be outlined as, firstly to encourage students to produce original design outputs to determined design problems and secondly, to encourage students to engage with local workshops to have their design mock-ups produced. It has been acknowledged that hands-on learning opportunities assist in decision making processes in regard to detail solving and material selection activities much needed in product design activities.

WTD (Wooden Toy Design) course in Kirikkale University's Interior Architecture and Environmental Design Department has been positioned by the instructor in the manner to serve as a laboratory for students to experiment on real life needs and solutions. In fact, the design problem has been planned to simulate a fictional need for a toy to be designed having Turkish mythology as a design criteria and the material would mainly be of wood. Students spent various hours in the research for types of wood that could be used in toy design and also existing toys in the market were analyzed. As the courses were online in regard to pandemic conditions in 2021, this physical constraint was turned to advantage when two different online meetings were organized with two different toy designer/manufacturers from different cities. With each meeting, certain technical questions were answered so most aspects had already been considered during the design stage. Following the initial information gathering stages, one of the main design constraints which had been the use of Turkish mythology was introduced and students further initiated their research in this subject. Two fictive entities from Turkish mythology were requested to be identified by each student. One entity would have positive characteristics and the other was supposed to have negative characteristics. Character development and preliminary design sketches were requested to be prepared for both entities. Finally a single character was asked to be selected and further character development studies along with the game type and user groups were requested to be determined. Uninterrupted design studies were finalized when designs had matured and approval for production was given to students by the course instructor.



Students who had completed their design stages had the next objective of determining a workshop to manufacture the designs. These designs had already been defined by 2D production drawings and 3D renders at this stage. The panic and shock responses from the students had been genuine. As explained in more detail further on, students faced various problems such as excessive costs, manufacturers not meeting delivery schedules, various communication problems between two parties or in minor cases where the designs were not taken seriously and frequently manufacturers insisting on producing their own suggestions instead of proposed designs. As a result, 47 students completed both the design and the manufacture stages of the course and works were presented to a jury consisting of academicians and wood toy designers that had provided support in the previous design stage. The jury was assembled in the university where both the students and the jury were physically present.

Even though there is sufficient literature citing the advantages of academia-industry collaboration for projects in product design classes, there is a lack of quantitative analysis and data on its gains. This article aims to quantitatively assess benefits gained and challenges experienced by incorporating a fictive project design requirement with real-life manufacture limitations. Students were held responsible for creating and delivering their design outputs manufactured in various local workshops, together with a 2D poster summarizing research, technical drawings and user data. The results reported in this article presents the student perspective on the whole duration of the course.

4. METHOD

Participants were 47 students from a total of 78 students who were enrolled in the course. Among the 47 students who were able to fulfill the requirements of the course and took part in the survey, 29 of the students were female and 18 of them consisted of male students. All students were enrolled in the Department of Interior Architecture and Environmental Design at Kırıkkale University in Turkey. The WTD course is a must course in the 3rd semester of the department's curriculum. The total duration of the project was 14 weeks which equals a semester. The total duration was spent on research, character development, project critiques and finally having the mock-up produced by local craftsmen.

Data Collection

An anonymous survey consisting of 30 questions was used to collect data. Participants were provided with a description of the study with its scope and intent and were asked to sign an informed consent statement. Participants were also asked their age and all were recorded to have been over 18 years before beginning the survey. No financial support or incentive was provided to participants for participating in or completing the survey.

A 5-point Likert scale was used for the majority of questions. For others, either students were asked to input values themselves, such as for gender and age or were asked to pick one or more options, such as for reporting factors that affect the quality of their output or while asked to describe their experiences with their industrial counterpart.

Data Analysis

Descriptive statistics were used in analyzing research results. Descriptive statistics use certain coefficients in order to summarize a given data set, these can either represent the entire or a sample of a population. The aim of using descriptive statistics is to restructure not so apparent relations within a large data set into easily definable small descriptions.

In statistics p-values are the probability of obtaining results with similar extremities as the results of a hypothesis, assuming that the null hypothesis is correct. A null hypothesis by definition proposes that no significant relationship is present within a set of variables and this coefficient is thereby used to account for the credibility of a hypothesis (https://www.investopedia.com/terms/n/null_hypothesis.asp). The numeric results are then used to account for the strength of relationships between two sets of variables if any. Therefore the p-value (probability value) is a number representing the level of statistical significance ranging between 0 and 1. When the number is smaller, evidence increasingly suggests that the null hypothesis be rejected. P-values equal or smaller than $p \leq .05$

suggest statistical significance. P-values higher than $p > .05$ suggests statistical nonsignificance and provides strong evidence for the validity of the null hypothesis being true. In other terms, statistical significance is a value that depicts the magnitude of a relationship between two variables (www.statisticshowto.datasciencecentral.com). Values of 47 inquiries were individually recorded in a spreadsheet to further proceed with above-mentioned correlation analysis.

5. RESULTS AND DISCUSSION

Of the 47 participants that completed and filled the survey, the percentage of females and males is presented in Figure 1 where 29 female and 18 male students have met course requirements, delivered designs and participated in the query.

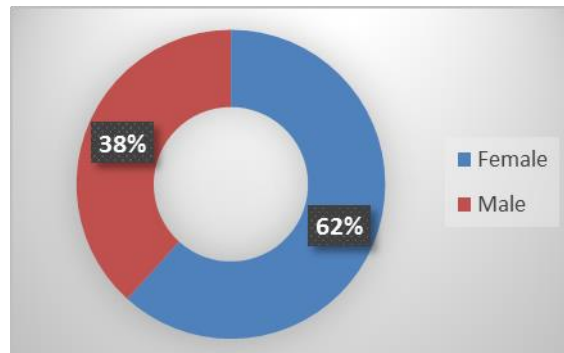


Figure 1. Gender distribution

When the knowledge levels of students in the beginning of the course were asked, 70% of all students answered that their level of knowledge was insufficient and they had studied Turkish Mythology to fulfill course requirements. Remaining 30% declared that they already had sufficient knowledge in the matter. Student opinions in Figure 2 regarding the use of Turkish Mythology as a design parameter in the course proved that students found it 'highly favorable' by the highest rate of 36%, 'favorable' by 30% and 'neutral' by 32%.

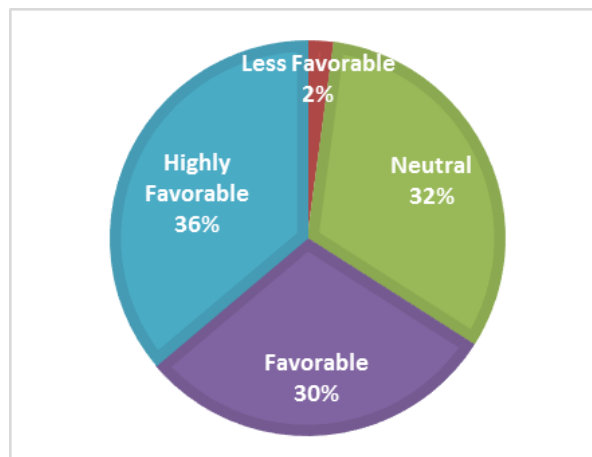


Figure 2. The use of Turkish Mythology as a Design Parameter

Student opinions on the production of toys in workshops due to course requirements is presented in Figure 3. Results demonstrate that students found it 'very important' by 30%, 'important' by the highest rate of 38% and 'neutral' by 26%.

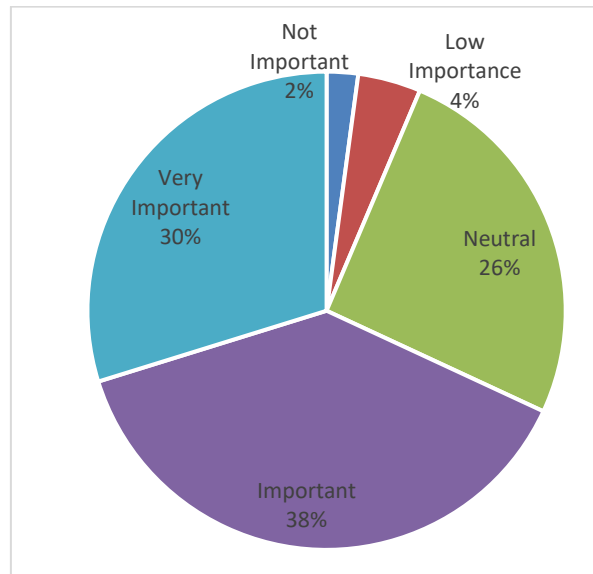


Figure 3. The production of toys in workshops

There have been other various inquiries related with factors such as personal time management skills, thoughts on the course being studied by distant education means, final presentation techniques (2D poster and the 3D toy model) and issues faced while trying to have the design manufactured. The relevancies of student answers have been evaluated by SPSS software and the results are provided in Table 1.

Table 2. Descriptive statistical results of two variables cross analyzed. For high significance the value is $< ,005$ and for nonsignificance the value is 0.

Variable 1	Variable 2	Sig.
Initial knowledge level below Neutral	Knowledge level at the end of the project	$< ,001$
Project time/duration perception	Personal time management skills	$< ,001$
Manufacture process	Difficulties faced during production	$< ,05$ $< ,003$

P-values have been used to generate -if any- relationships between two different variables. In this case firstly, the initial knowledge levels of students that were below neutral level in regard to Turkish mythology has been compared to their knowledge levels at the end of the project. The result p-value of this query was $p = < ,001$ which depicts a very high significance. In accordance with expectations, students that stated that their knowledge in Turkish mythology was insufficient when starting the course; had increased to acceptable levels at the end of the term. Figure 4 represents the rate of students who stated they had insufficient knowledge regarding Turkish mythology as 72%. Whereas students who had previous knowledge of Turkish mythology before the course were 28%.

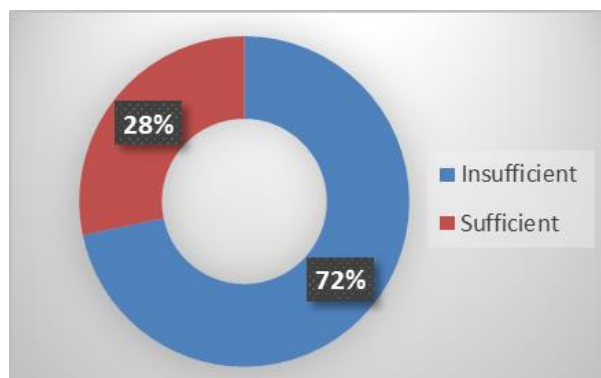


Figure 4. Knowledge levels of students in Turkish mythology before the course

Perception of time use has been the next area of inquiry. The total duration of the course was 14 weeks or in other terms a whole semester. The students took weekly critiques and thus advanced their designs. Students had one midterm where their advancements until that date were evaluated. All finished designs, composing of an informative poster and the model that had been manufactured by local workshops were evaluated and graded by a jury consisting of academicians and freelance designers at the end of the semester. Figure 5 shows the project duration perceptions of students. A majority of students totaling 53% evaluated the time allocated for the project to be sufficient and highly sufficient levels above neutral.

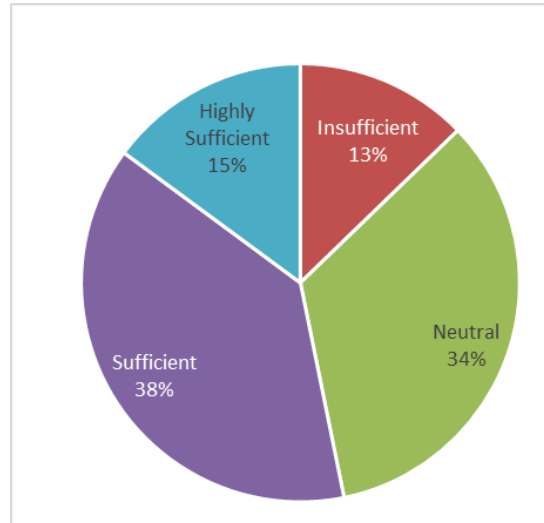


Figure 5. Project duration perceptions of students

Personal time-management abilities of students at the end of the semester have been evaluated in Figure 6. To this inquiry a satisfactory rate of 55% of students responded above neutral as sufficient and highly sufficient levels.

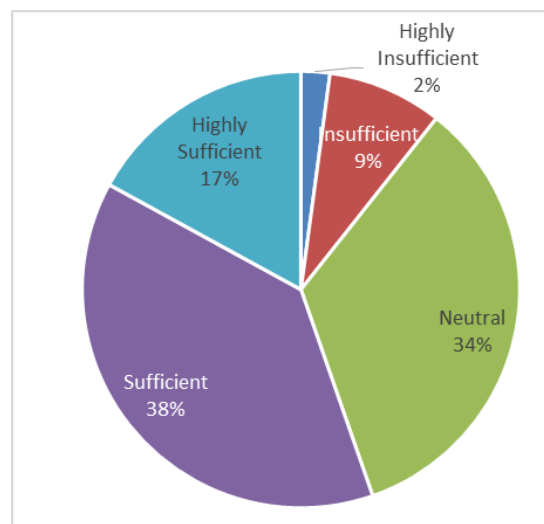


Figure 6. Personal time-management abilities of students at the end of semester

The calculated p value regarding the time perception and personal time-management abilities has been calculated as $p = < ,001$ in Table 1. This figure denotes the relationship between two variables to be very highly significant. Higher values of duration perception for the project are affirmative with higher expressed time-management ability values of students.

During semester, the whole activity of designing and producing the wooden toy has been divided into certain stages. At the end of each stage students are either expected to receive an affirmation to proceed or to review and then resubmit their design proposal. Stages of approval are as follows: design idea, material selection, detail selection and a final approval for the start of manufacture. Prior to final approval for manufacture students have found manufacturers with their own means and placed their orders. Students were asked to define their experiences with their produced designs. The results were limited to a maximum of three options. Answers given that were used to define students' finished products assessment have been summarized in Figure 7.

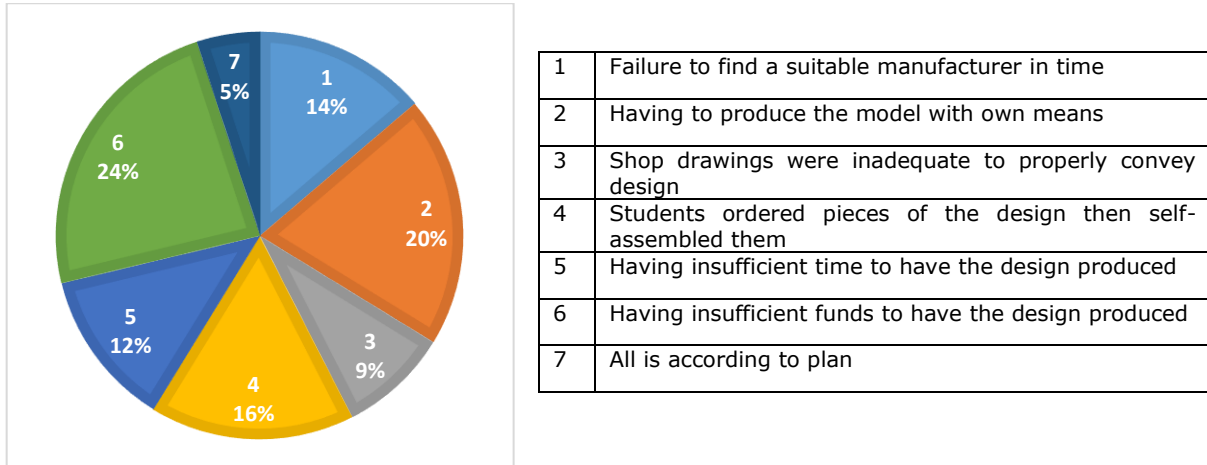


Figure 7. Finished products assessment

Majority of students have reported their experiences with their finished products as (6) *Having insufficient funds to have the design produced* by 24%. Second major definition has been (2) *Having to produce the model with own means* by 20%. This answer might have been affected by *insufficient funds* (6) or *failure to find manufacturer in time* (1). The third major definition has been (4) *Students ordered pieces of the design then self-assembled them* by 16%. Rest of reported definitions have been (1) *Failure to find a suitable manufacturer in time* by 14%; (5) *Having insufficient time to have the design produced* by 12% and the least reported definitions have been (3) *Shop drawings were inadequate to properly convey design* by 9% and finally (7) *All is according to plan* answers by 5%.

A separate question inquired about the problems that students had faced during the manufacture stage, the results were limited to a maximum of three options. Results have been summarized in Figure 8.

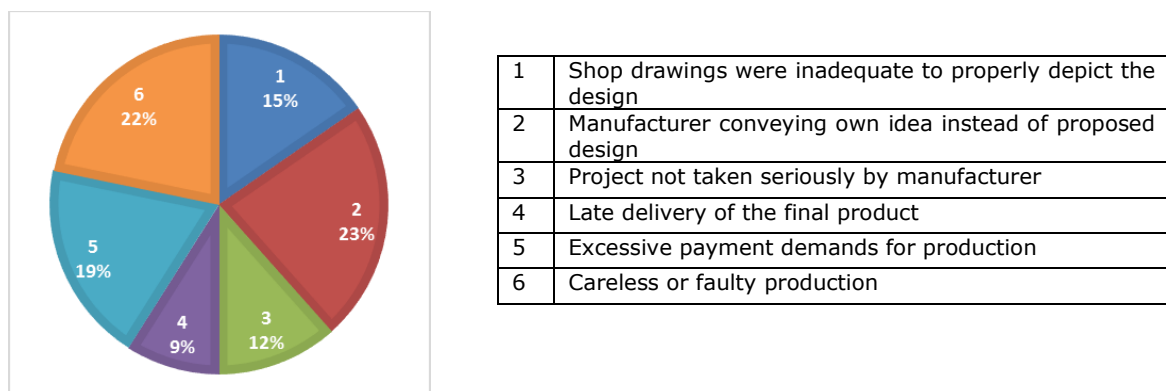


Figure 8. Problems faced by students during manufacture stage



Two of the biggest reported problems were (2) *Manufacturer conveying own idea instead of proposed design* by 23% and (6) *Careless or faulty production* by 22% respectively. The third reported problem was (5) *Excessive payment demands for production* by 19%. (1) *Shop drawings were inadequate to properly depict the design* was reported to be a problem by 15%. (3) *Project not taken seriously by manufacturer* was reported as a problem by 12% of the students. Finally, (4) *Late delivery of the final product* was reported by 9% of the students as a problem. Apart from original student experience, inconsistencies between the manufactured design and the design poster posed a whole different issue on the instructors' behalf. By principle, general consensus was that poster presentations would depict the design as planned, whereas the produced models were expected to resemble as much as the design proposal. Reasoning for this decision was that the confrontation with manufacturers would pose a reasonably great challenge for students by itself alone. The focus of the course was on hands-on learning aspect of design realization rather than trying to achieve up-level design output expectations.

The calculated p values regarding the finished products assessment and problems that students have faced during the manufacture stage have been calculated to seek whether any level of significance could be determined between two sets of variables. Entities that have significance are as such: the p value for (2) *Having to produce the model with own means* and (2) *Manufacturer conveying own idea instead of proposed design* has been calculated as $p = ,005$ so there is a significant relationship present between these two variables. Another meaningful relationship has been calculated for (5) *Having insufficient time to have the design produced* and (2) *Manufacturer conveying own idea instead of proposed design* as $p = ,003$ so there is a significant relationship between two variables. Final set of meaningful relation exists between (6) *Having insufficient funds to have the design produced* and (5) *Excessive payment demands for production* as $p = < ,001$ which suggests the relation being very highly significant between these two variables.

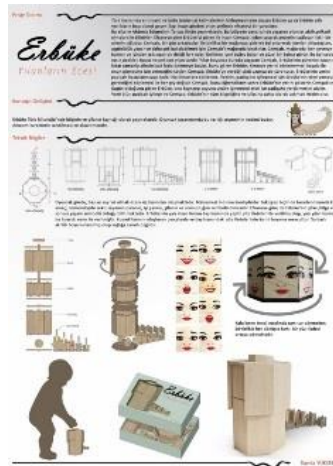
Overall, one of the most highly rated questions were improvement in students' design capacity by the end of the semester, facilitated via the hands-on project. This finding is encouraging, despite the problems faced and challenges experienced in their first exposure to a real industry project with high output expectations, students self-report various gains in their design abilities. Students appear to have appreciated the experience to work on a real project from industry to further their education.

When asked whether they would prefer to work in groups or individually, 47% of total students stated that they would favor working in groups; whereas 49% of total students stated that they preferred to work individually. Surprisingly, 4% of total students have failed to provide an answer for this simple inquiry. Further inquiries revealed more interesting results. The seemingly equal rate showed that 71% of female students were supportive of collaborative teamwork for future projects, while the remaining 29% responded in favor of working alone in future projects. Interestingly the numbers were just the opposite for the other sex. Male students were 29% in favor of collaborative studies in future projects, while remaining 65% stated that they preferred to work alone in future projects. Further research on gender preferences might reveal professional attitude differences in post-graduation.

Final Projects

Among 47 total projects designed and produced, this part of the article presents a selection of six sample projects. All projects are successful examples of the continuous design process. All the owners of selected projects have analyzed Turkish mythology and identified bad and evil characters. Then one—but in fewer cases both— of these characters have been selected and character generation has been initiated. Main focus has been to produce as original ideas as possible in terms of devising both the game and the toy simultaneously. However it must be noted that the main focus was on designing the toy rather than the game. The reason for this was to keep design efforts limited within a certain framework. In minor cases where students felt obliged to design the game as well, their proposals were

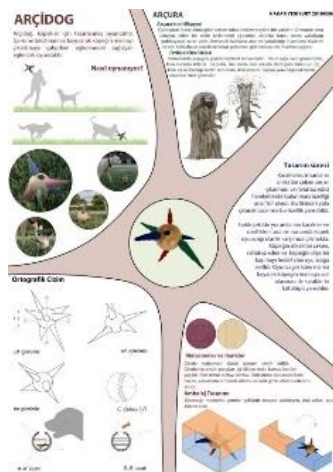
taken into consideration. The designs aim to identify certain habits or characteristics of fictional beings so the forms and colors of characters have been selected accordingly.



Erbüke – Damla Yüksek

Figure 9. Erbüke Toy by Damla Yüksek (Source: Personal Archive, 2022)

Figure 9 by Damla Yüksek is a toy depicting Erbüke the queen of snakes who was cited in references as the source of wisdom and healing in Turkish mythology. The head and body of the toy has 8 sides. The number 8 in Turkish mythology is important as there are four main and four more sub-directions. There is also a tail attached to the body of the toy drawing references to a snake.



Arçidog – Hakan Yeniuyurt

Figure 10. Arçidog Toy by Hakan Yeniuyurt (Source: Personal Archive, 2022)

The toy in Figure 10 designed by Hakan Yeniuyurt is called Arçidog. The toy is intended to be played by dogs. The sphere has a maze-like inner structure where owners can place a reward food inside the slot and the dogs would try and take it out to eat the treat. The toy was inspired by Arçura; an evil spirit living in the forest who tickles whomever that disturbs it.



Köşe Bucak – Hacer Aydemir

Figure 11. Köşe Bucak Toy by Hacer Aydemir (Source: Personal Archive, 2022)

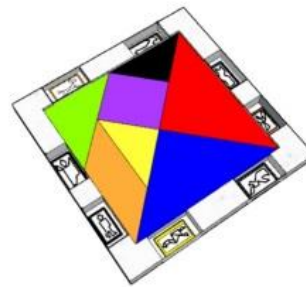
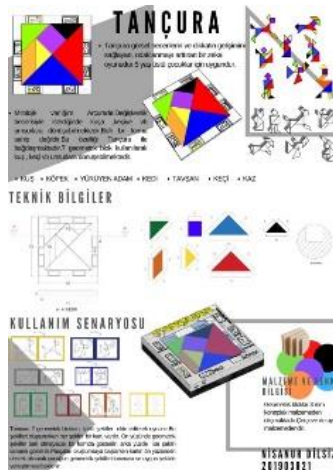
Figure 11 is the game named Köşe Bucak designed by Hacer Aydemir. The game is about the struggle between two famous mythological dragons Bükrek and Sangal.



Karayel – Navruz Erciyas

Figure 12. Karayel Toy by Navruz Erciyas (Source: Personal Archive, 2022)

Figure 12 is also a board game named Karayel designed by Navruz Erciyas. The name has been derived from mixing the names of the evil being Yelbegen and the kind being Karakuş. Whoever reaches the middle of the board wins the game and owns the valuable eggs in the center.



Tançura – Nisanur Dilsiz

Figure 13. Tançura Toy by Nisanur Dilsiz (Source: Personal Archive, 2022)

Figure 13 is called Tançura designed by Nisanur Dilsiz. The game is essentially a tangram being named after Arçura. Arçura does not have a specific form but can transform into seven different bodies of a bird, dog, human, cat, rabbit, goat and a duck.



Figure 14. Zill-Roll Toy by Said Kiraz (Source: Personal Archive, 2022)

Figure 14 is a rolling and folding toy named Zill-Roll designed by Said Kiraz. The toy has been developed from the mythical Zilant having a head of a dragon, the body of a bird, the tail of a snake and the ears of a dog.

The outputs of the course which have been the designed and produced toys have been satisfying on behalf of both the students and academicians equally. On the instructors' part, the identification of Turkish mythology as a design topic has created a highly anticipated interest in students. Having researched the topic, students have acquired a sense of unity with some forgotten and neglected fictional beings of ancient times. Students have also been encouraged to participate in various design competitions, thus aiming to increase the benefits of the project duration. Additional benefits have been gained via the academia-industry collaboration where most if not all students have benefitted from the advantages of hands-on learning principles. Students have had the chance to experiment with massive wood and other wood-based materials. Students have associated theoretic knowledge of materials and joint systems with practical real-life objects and manufacturing methods.

6. CONCLUSION

Interior architecture discipline is one that highly requires practical application knowledge besides theoretical knowledge. Designers of the future era must master both types of updated information. After graduation, designers need to educate themselves to function flawlessly both in front of the computer and additionally on site. Technical and aesthetical knowledge about almost anything related to various topics such as construction industry or changing trends is crucial while making design decisions and then while briefing manufacturers on site. Interior architects must time after time prove themselves capable of making decisions both to patrons and also to technical manufacturer parties. While briefing manufacturers interior architects must know every detail of various disciplines just as well as the craftsman performing the task. Interior architects must also keep themselves updated with most recent materials and applications. Most of the time the interior architects are obliged to exceed expectations of customers or patrons.

Interior architecture profession is interdisciplinary in the sense that it serves as a crucial binder between people who seek to live in distinctive spaces and the skilled craftsmen who are able to attribute to the construction of such spaces. The interior architect is trained so that he/she can create and convey unique designs to patrons in 2D technical drawings and 3D renders and animations thereby defining a new way of living for them. The interior



architect is the visionary dreamer of high value spaces. However romantic this idea must sound, interior architects prepare the necessary technical drawings therefore binding dreams to actual life. Interior architects must be able to technically produce relevant drawings in the correct manner so that they can be produced correctly the way they are drawn. Failure in technical communication results in workers or craftsmen taking initiative and to decide on details instead of the interior architect. This responsibility is a serious one so that it ought not be placed in the hands of others than the designers. After all the interior architect is solely responsible for all that is unique, complete and beautiful as well as for all that is faulty, incomplete and ugly.

Academia can not overlook the important role interior architects fill in the construction industry. It is the main focal point of all interior architecture departments to equip students with technical knowledge as well as improving their creative skills. With the use of hands-on learning methods, it is of utmost importance that students work with real materials and solve real design problems and to do so with existing craftsmen in local workshops. Interior architecture departments must teach near-future colleagues to think of design in a global sense while describing the same design in a local context to manufacturers. Drawings are mere tools to overcome cultural and comprehensive barriers between different parties namely the patron, the designer and the craftsman.

The aim of this study has been to contribute to literature supporting the advantages of academia and industrial collaboration. Student responses to questions revealed new results open for debate as discussed thoroughly in the Results and Discussion part of the study. In terms of gender differences, interestingly enough; responses regarding the proposal of creating study groups was accepted positively by female students but rejected strongly by male students.

From the academic point of view, the use of mythology has proved to be a valuable source for developing new ideas. The use of Turkish mythology has provided students with a vast variety of options for both character development and game design. The method used has on the one hand enriched students' imagination and on the other, provided them with valuable experiences both with material selection and with placing orders and having items produced in workshops. The cycle of;

- creating new ideas,
- preparing necessary technical documents,
- overseeing production,
- final delivery

are the exact four stages of the professional interior architects' work pattern. All 47 students that have completed the WTD course have experienced the working cycle of the professional interior architect first hand.

Regarding problems encountered during the process, 24% of students have reported insufficient funds to be the biggest problem. 20% of the students who could not afford to commission workshops, preferred to self-produce their designs. 16% of the students reported the difficulty of assembling and painting pieces that had been cut and prepared by the workshops. Only 5% of the students which was the smallest answer group reported no problems whatsoever and had completed the duration all according to their plan.

A separate inquiry about the experience with the manufacturers revealed that 23% of manufacturers insisted on altering designs and trying to convey their ideas instead of the proposed design. 22% of students reported that workshops failed to deliver designs successfully and their deliveries had been careless and faulty. 19% of students complained about excessive payment demands for producing student designs.

Despite all reported problems, students have appreciated the chance to have worked on a real project and to have commissioned their designs for the very first time in their lives. It is assessed that the whole experience has been educative from all angles. Students have



deliberately been encouraged to confront problems of commissioning, overseeing and collecting orders. More successful designs were ones that had the least difference between design and delivery. Students that could not overcome problems related with the producers either had to change their designs, or to present their design and delivered model with a big difference between them.

In summary, the use of Turkish mythology has enriched the imagination of students and has helped to form a strong cultural bond. The experimentive course has offered the chance to design and work with a wide variety of wood based materials. First-hand knowledge transfer from actual toy designers to students has been accomplished. Finally, the commissioning of designs to workshops has been an altogether valuable experience for students.

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