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The Analysis of the School Factor in Industrial Design Competitions: 2015-2020 İMMİB* Competition Student Category Winners

* Turkish Steel Exporters' Association

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Abstract: Turkish Steel Exporters' Association (İMMİB) Industrial Design Competition is important both for professionals and students among Turkish designer community for many reasons. In addition to its nationwide recognition, the winners are awarded with many monetary and non-monetary benefits. Particularly the international scholarship for graduate education is a major motivating factor for students for participating to the competition. The main objective of this study is to reveal school related factors that affect İMMİB Industrial Design Competition student category results. For this reason, data on 2015-2020 İMMİB Industrial Design Competition winners have been analysed. The analysis has been carried out by doing document analysis from secondary sources and applying an on-line survey to the winners. A total of 92 prizes have been distributed between 2015-2020 to 84 students. Out of 84 students, 42 participated to the survey and 40 valid responses were obtained. Results reveal that i) the older the department, the higher the frequency of winners coming from that particular university, ii) for students coming from universities adopting the central examination system, the majority of students have relatively high entrance exam scores, iii) the majority of the projects are done during course hours at school, particularly in the case of privately owned universities. This paper discusses the reasons and the outcomes of working competition projects during course hours particularly design studio courses. Ethics and privacy are revealed as potential problem areas as an outcome of carrying out the competition preparation during course hours.

Keywords: Design Education, Design Competitions, Design Studio Curricula, Student Design Competitions.

Introduction

Volker (2010) claims that competition is an essential design tool that enhances a certain level of architectural quality through jury assessment and enables a fruitful architectural debate. Starting with the Greeks, architectural competitions have been a means of creating major public buildings (Strong 1976). Competition organisations are also contemplated in other design related disciplines such as engineering design. Industrial Design Competition organizations on the other hand are relatively new compared to other disciplines however they are fast becoming an important instrument for delivering innovative products and solutions thus corporations, foundations,

governments or individual entrepreneurs sponsor and organise competitions with targets and prizes (Lampel et al. 2012, 83). Er (2021) stated that, when design competitions are concerned a distinction between design competitions and design awards should be made. In *design competitions* the artefact is presented as an idea, the jury members evaluate the concept, the designer is the applicant (Er et al., 2021). In *design awards* the artefact is already developed, so the jury evaluates the completed and launched product, the applicant is the brand (Er et al., 2021). However, in recent years the phenomenon is changing as some organizations (ex. the Red Dot Design Concept Award) have started to offer a new category of awards for the ideas to which students can also participate. According to Wang (2019), there are non-profit competitions that aim promoting the design industry or commercial awards that achieve the profitability of the design brand. Turkish Steel Exporters' Association (İMMİB) Design Competition is an example of non-profit competitions that aims to promote design at a national scale. Whether it is a design competition or a design award, the answer to the question regarding if competition preparation should be within the Capstone or Extracurricular remains debatable (Khorbotly & Al-Olimat 2010).

This paper is about Turkish Steel Exporters' Association (İMMİB) Design Competition student category winners between 2015-2020. It focuses if the schools that the winning students attend at the time of the competition have any direct impact on successful results. İMMİB Design Competitions have been studied by various authors (Dilek & Kaygan 2018; Gelmez 2011; Çopur 2017). Dilek and Kaygan focus on the jury factor whereas Çopur explores the competition in general during the 2005-2015 period. As to the knowledge of the authors, this paper is the first study that elaborates on the impact of school related factors on design competition performance in Turkey.

The major motivating factor for this study comes from the fact that the first and the second authors of this paper organized a design studio course in collaboration with a professional designer for the 2nd year industrial design students in a newly established industrial design department. The results aroused the curiosity of the authors concerning if other schools also implement such an approach during the preparation for the competition. The main objective of this study is to reveal school related factors that affect industrial design competition student category results.

Student Design Competitions: Should they be included in the design studio curriculum or not?

Design studio pedagogy literature emphasizes that current approaches to teaching architectural design continue to follow the principles, rules, and practices under the influence of the traditional Beaux -Arts and Bauhaus models (Salama 2015). However, recent literature also suggests that the central role of the design studio in the conventional pedagogical structure of architectural education needs to be reconsidered, with an interdisciplinary approach (Toprak & Hacihasanoglu 2019) in order to respond to current social, economic, ecological and technological changes (Pasin 2017, 1270; Boyer & Mitgang 1996). Boyer and Mitgang (1996, 73) state that at virtually all schools, design is quite rightly considered the heart of the curriculum and they add that the term 'design,' as commonly used by architects and architecture educators, has taken on limited connotations, focusing more on the aesthetic and theoretical dimensions of design than on the integrative nature of the process itself.

Traditional approach to industrial design education is changing by means of moving away from the traditional notion of art and craft-based models to integrate more into the curriculum social sciences such as anthropology, sociology, psychology together with marketing, technology and a more systematic approach to the design and development process. (Frascara 2002; Popovic 2005). In this aspect student design competitions may turn out to be instrumental since participation to a student design competition is likely to increase student engagement in a multi-disciplinary research activity. According to Zhang and Wang (2018)

the design competition conveys the voice of the market and the enterprise, and provides a new teaching method for the teaching practice of industrial design and the improvement of students' innovative ability. In addition, student design competitions enrich the classroom teaching methods and materials, so that education is closer to the market (Wang 2019, 5).

Particularly after the turn of the millennium, it is observed that in the curriculum of some universities in Poland, Brussels, China, Spain, US the design competition has been embedded in industrial design (Zhang & Wang 2018); in engineering (de-Juan et al. 2016; Raffeor et al. 2013; Khorbotly & Al-Olimat 2010; Wankat 2005) and in architecture teaching systems (Haupt et al. 2019; Hermand & Rajeb 2019; Senior & Holt 2014).

Existing literature (Kreiner 2009; Gottschling 2018; Hermand & Rajeb 2019) argues that design competitions are a unique opportunity in architecture design studio courses because they supply material for student portfolios, provide a common repository of guidelines, challenge participants to work together on complex integrated projects, develop skills in architectural augmentation and enhance communication. Wang (2019) claims that the ambiguity concerning the quality standard of design education leads the society to pay more attention to explicit achievements such as design competitions. Wankat (2005) argues that well designed student competitions increase student learning, help them learn practical aspects of engineering and motivate many students to work harder. According to Hermand and Rajeb (2019, 167) 'the relevance of the design competition is acknowledged worldwide and has several targets such as disclosing new talent to gain insight in competences'.

On the other hand, Hermand and Rajeb (2019) also claim that design competitions have some limitations in terms of studio pedagogy, because specifications are vague and not precise enough and the assessment criteria are difficult to quantify. Wang (2019) points out the danger concerning student performance evaluation criteria when competitions are included in the curriculum stating that the academic evaluation criteria focus on a long-term basis whereas design competition evaluation focuses on short-term tactical applications. Lack of protection of intellectual property is another issue because in many design organisations as in the case of İMMİB, designs are seen by the organizers and the jury without any registration, only the winning designs are registered afterwards.

In Turkey, particularly between 1995-2014 the total number of industrial design departments has increased by 525 percent (Irkdaş Doğu et al., 2015). In developing countries like Turkey and China, the increase in the number of industrial design schools fosters rivalry during student admission between universities and in that aspect design competitions turn out to be one of the reference standards to judge the effectiveness of a running a school (Zhang & Wang 2018).

One of the questions this research elaborates on is the reason why some institutions consistently win a specific student competition and in that respect engineering design literature reveals the importance of tradition; the alignment of the curriculum with the competition; the teacher's critical role and student quality and motivation (Wankat 2005, 346).

Analysing existing literature on architectural, engineering and design education we identify *motivation* and *means* as two main school related factors in winning the design competitions. *Motivation* entails students' motivation, instructors' motivation and administrations' motivation. Motivational research requires in depth interviews and detailed qualitative analysis therefore it will be the subject of another paper that is planned to be written by the authors.

Means on the other hand concerns student quality, school tradition and alignment of the curriculum with the competition. In this paper, we aim to reveal the means of having which assets mostly, students achieved to win the competition between 2015-2020. In order to understand the effect of *student quality* we

hypothesize as follows; H2: *Students coming from schools with special ability exam make up the majority of winners*. (As the authors have opposing views on this hypothesis, it has been tested as formulated by the first author. In Turkey, *admission with special ability exam* requires candidate students to draw sketches during the exam whereas *admission with central examination system* requires the candidates to solve multiple choice questions of math, physics, chemistry, biology and Turkish language. Therefore the first author believes that particularly in the early years of undergraduate education students coming from schools adopting the special ability exam have an advantage in better expressing their ideas visually.) H3: *For students coming from universities with central examination system, the majority of winning students have relatively high entrance exam scores*. In order to understand the effect of *school tradition* we hypothesize as H4: *The older the department, the higher the frequency of winners coming from that university*. In order to understand the *alignment of curriculum* we hypothesize as H1: *The majority of projects are developed during courses at universities.*

Methodology

This study comprises of two parts, the *exploratory research phase* and the *descriptive research phase*. Social science exploration is defined by Stebins (2001) as a broad-ranging, purposive, systematic prearranged undertaking designed to maximize the discovery of generalizations leading to description and understanding. *Exploratory research* is the process of investigating a problem that has not been studied or thoroughly investigated in the past. Since this is the first study investigating the effects of school related factors on İMMİB student competition success, specific research questions and hypothesis used in the descriptive research phase were derived from compiling secondary sources. For this purpose, İMMİB catalogues between 2015-2020 and school websites have been deployed. All catalogues were available on the İMMİB website except for 2018. The 2018 competition results were obtained from İMMİB Secretariat via e-mail on April 8th 2021. Winner names, winner ranks, their schools and departments have been obtained from these catalogues. All the data was entered to an Excel Sheet and the following hypotheses were formed:

Hypothesis #1: The majority of projects are developed during courses at universities.
Hypothesis #2: Students coming from schools with special ability exam make up the majority. (As the authors have opposing views on this hypothesis, it has been tested as formulated by the first author.)
Hypothesis #3: For students coming from universities with central examination system,

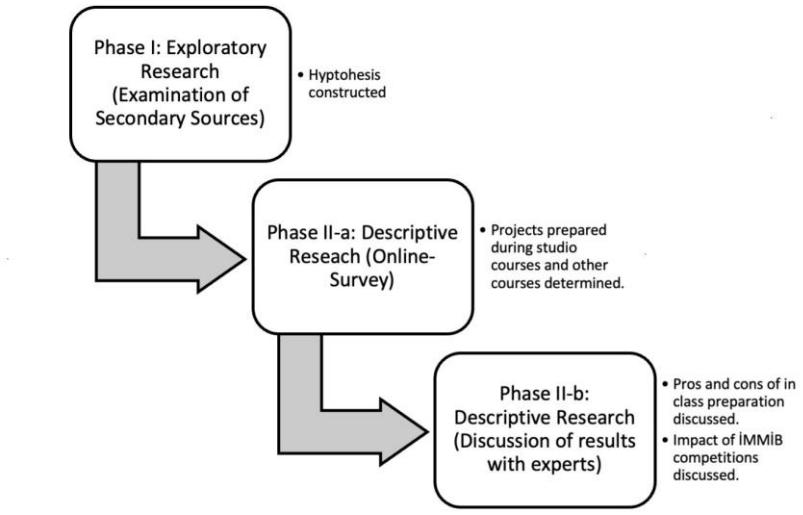


Figure 1: *Main Stages of the Research*

the majority of winning students have relatively high entrance exam scores.
Hypothesis #4: The older the department, the higher the frequency of winners coming from that university.

The *descriptive research phase*, was carried out by means of on-line surveying the winners in June 2021. The questionnaire was developed using exploratory findings and particularly taking into account the hypothesis constructed. Some of the critical data explored during the exploratory phase was also double-checked by means of the on-line questionnaire.

The sample population has been selected among İMMİB Industrial Design Competition Student Category Winners between 2015-2020. For six consecutive years in total 92 prizes have been distributed to 84 different students by İMMİB. Within the scope of this study, we reached 42 out of 84 of these winners. The contact was established in June 2021 by means of sending e-mails through LinkedIn and personal e-mail addresses where available. The winners were invited to participate to the on-line survey. The survey was delivered to the participants using Qualtrics Software. In total 42 responses were obtained. Out of 42 responses, 40 turned out to be valid, thus could be used for the analysis. Out of 40 winners whose data was used for the analysis 19 were from state owned universities and 21 were from private universities. When compared to total population the state/private breakdown of the sample shows a similarity: 44/40 in total population versus 19/21 in sample population. Figure 1 demonstrates the main stages of the research.

Ethical Considerations
Prior to data collection, ethical approval for the research was granted by Istanbul University Social Sciences and Humanities Ethical Committee on 03.05.2021. All participants were informed about the scope and aims by means of Participants Information Sheet and Consent Form which was embedded at the beginning of the online survey. Participants were advised that their participation was voluntary and that they had the right to withdraw, without reason, at any time.

Findings
Phase I: Exploratory Research Findings
As an outcome of the exploratory research a database was formed. The database included the following columns: *year* (2015-2020), *industry categories* (plastics, metals, lighting etc.), *name of the projects*, *name of the student*, *name of the school*, *school category* (state-owned or privately-owned).

As the database was analysed it was observed that with a few exceptions more recently

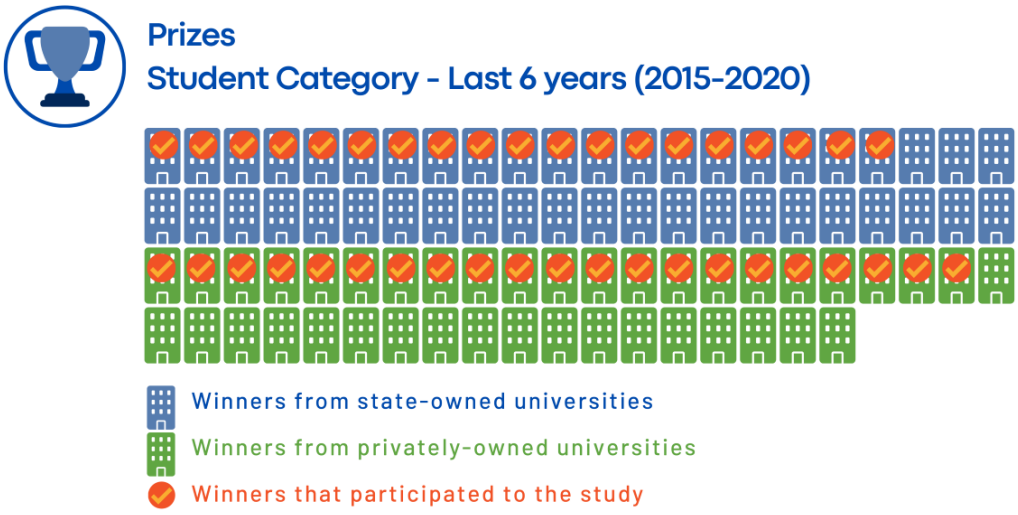


Figure 2: *Study participants*

established schools had accumulated less number of prizes in the past six years. Therefore, the correlation coefficient between the number of years since the establishment of the industrial design department and the total number of prizes accumulated, was investigated. The calculation was done using Excel and the correlation coefficient turned out to be +0.44. According to Ratner (2009), +0.44 means a moderate positive relationship. During the analysis it was noticed that for some schools there was a significant gap between the year of establishment and the enrolment of the first students. Therefore, the correlation coefficient between the number of years since the first enrolment of students and the total number of prizes accumulates was also calculated. This time the correlation coefficient turned out to be even higher with a value of +0,50, meaning that the longer the duration of the teaching experience, the higher the number of prizes accumulated. (Thus **hypothesis #4** was *not rejected* and it is concluded that the older the department, the higher the frequency of winners coming from that university. Table 1 demonstrates the data that was used for determining the correlation.

Table 1: *Number of winning prizes between 2015-2020 and number of years since the establishment of industrial design departments.*

	University Ownership	SCHOOL	# of Winning Prizes Between 2015-2020	% of Winning Prizes Between 2015-2020	Industrial Design Department Establishment Year	Industrial Design Department Enrolment Year of First Students*	# of Years Since Establishment as of 2021	Reference (for establishment year)
1	Private	Istanbul Medipol	12	13	2015	2015	6	https://www.medipol.edu.tr/akademik/fakulteler/guzel-sanatlar-fakultesi/dekanin-mesaji (accessed 23 March 2022).
2	State	Mimar Sinan***	11	12	1971	1972	50	https://msgsu.edu.tr/akademik/mimarlik-fakultesi/bolumler/endustriyel-tasarim (accessed 23 March 2022).
3	State	Marmara***	9	10	1985	1985	36	http://eut.gsf.marmara.edu.tr/genel-bilgiler (accessed 23 March 2022).
4	State	ODTÜ***	9	10	1979	1979	42	https://id.metu.edu.tr/en/history/ (accessed 23 March 2022).
5	Private	TOBB	9	10	2011	2013	10	https://www.etu.edu.tr/files/dosyalar/2017/12/21/f32ef8d92ca637c62c5505fc0325c5e4.pdf (accessed 23 March 2022).
6	State	Gazi	8	9	2012	2012**	9	https://mim-eut.gazi.edu.tr/view/page/65221 (accessed 23 March 2022).
7	Private	Bahçeşehir	6	7	2008	2010	13	http://content.bahcesehir.edu.tr/public/files/files/2011katalog_TR_binder4.pdf (accessed 23 March 2022).

8	State	Anadolu (name changed to "Eskişehir Technical")	3	3	2000	2000	21	https://mtf.eskisehir.edu.tr/Icerik/Detay/endustriyel-tasarim-bolumu (accessed 23 March 2022).
9	State	İTÜ***	3	3	1993	1993	28	https://tasarim.itu.edu.tr/en/education/undergraduate-program (accessed 23 March 2022).
10	Private	Özyeğin	3	3	2013	2014	8	https://www.ozyegin.edu.tr/en/industrial-design/overview (accessed 23 March 2022).
11	State	Selçuk	3	3	2008	2013	8	https://www.selcuk.edu.tr/Hakkinda/guzel_sanatlar-endustriyel_tasarim-fakulte_bolum (accessed 23 March 2022).
12	Private	Istanbul Aydın	2	2	2013	2017	8	https://www.aydin.edu.tr/en-us/akademik/fakulteler/mimarlik/Pages/Dekanın-Mesajı.aspx (accessed 23 March 2022).
13	Private	Kadir Has	2	2	2004	2012	17	https://bologna.khas.edu.tr/program/50000672 (accessed 23 March 2022).
14	Private	Melikşah (now a part of Erciyes University)	2	2	2008	2009	13	https://dokuman.osym.gov.tr/pdfdokuman/ariv/2009/2009_OSYS_TERCIH_KILAVUZU/tablo4.pdf (accessed 23 March 2022).
15	Private	Yaşar	2	2	2010	2010	11	https://obs.yasar.edu.tr/oibs/bologna/index.aspx?lang=tr&curOp=showPac&curUnit=6&curSunit=401133# (accessed 23 March 2022).
16	Private	Beykent	1	1	2012	2012	9	https://obs.beykent.edu.tr/oibs/bologna/index.aspx?lang=tr&curOp=showPac&curUnit=03&curSunit=1673 (accessed 23 March 2022).
17	Private	Istanbul Bilgi	1	1	2009	2011	10	https://www.bilgi.edu.tr/en/academic/faculty-of-architecture/about/ (accessed 23 March 2022).
18	Private	Istanbul Ticaret	1	1	2014 (establishment year unknown, enrolment of first students 2014)	2014	7	https://ticaret.edu.tr/uploads/dosyalar/1178/soru.pdf (accessed 23 March 2022).
19	Private	Izmir Ekonomi	1	1	2004	2006	17	https://fadf.ieu.edu.tr/en/dekanimizin-mesaji (accessed 23 March 2022).
20	State	Karabük	1	1	2005	2012	9	https://gstf.karabuk.edu.tr/icerikGoster.aspx?K=S&id=96&BA=end

								ustriurunleri-en (accessed 23 March 2022).
21	Private	Izmir (name changed to "İzmir Democracy")	1	1	ID Dept. NA ****		NA	
22	State	Kocaeli	1	1	ID Dept. NA ****		NA	
23	State	Yıldız	1	1	ID Dept. NA ****		NA	
		TOTAL PRIZES	92	100				

* Reference (for Enrolment Year of First Students): ÖSYS (University Entrance Examination) Guide (2000-2019) (online), Available at: https://www.osym.gov.tr/ (accessed 31 March 2022).
** According to Gazi University website the first enrolment of students is in 2012. (https://mim-eut.gazi.edu.tr/view/page/65221). According to the Guide the industrial design department was first under the faculty of Fine Arts and first students were enrolled in 2008, the department was then transferred to the Faculty of Architecture in 2012.
*** Data on İTÜ, ODTÜ, Mimar Sinan, Marmara enrolment year of first students was taken from university websites since the Guide for related years was not available.
**** ID Dept. NA: Kocaeli, Yıldız and Izmir Universities do not have an industrial design department. Winners were from interior design and architecture departments. Therefore, data was not available for the year of establishment of the industrial design department.

When columns are compared particularly 3 schools, namely İstanbul Medipol University, İstanbul Technical University and Anadolu University seem to be the exceptions that form the fuzziness of the linear rule.

Phase II: Descriptive Research Findings

Descriptive research was carried out by the online survey. The valid number of responses from the survey turned out to be 40. In total 13 questions were asked to the respondents. The first five questions were concerning the consent form approval and personal data, so they have not been included in the findings.

Q6: What is the name of the department that you got/will get your undergraduate degree from?

Out of 40 responses 38 (95 percent) turned out to be from industrial design and 2 (5 percent) from interior design departments. It was observed that the majority of student winner category winners come from industrial design departments.

Q7: What is the name of the university that you graduated/will graduate from?

The respondents came from 16 different universities. The total population comprised of 23 universities. This means that 70 percent of the universities were represented in the sample population of this study.

Q8: Which of the following defines best the institution you graduated from/will graduate from?

- It is a state-owned university.
- It is a privately owned university.

In the total population, there are 44 (52 percent) winners coming from state owned universities and 40 (48 percent winners coming from privately owned universities in the 2015-2021 period. In the sample population, the number of winners coming from state owned universities is 19 (48 percent) and from privately owned universities is 21 (52 percent). In other words, when we analyse the state-owned/privately-owned university ratio both for total population and for sample population, almost half of the students are coming from state universities and the other half is coming from privately owned universities. Out of 23 universities in the total population, 10 (43 percent) of them are state owned and 13 (57 percent) of them are privately owned. In the sample population there are 16 universities of which 8 are state owned and 8 are privately owned. These figures suggest confidence on the representativeness of the sample population.

Q9: If you are a graduate of a privately owned university which of the following defines your status best?

- I studied with full scholarship.
- I studied with a 75 percent partial scholarship.
- I studied with a 50 percent partial scholarship.
- I studied with a 25 percent partial scholarship.
- Other

Since the number of winners coming from privately owned universities in the sample population was 21 it is expected to get 21 responses at maximum for this question. However, the total number of responses turned out to be 26 when the answers the responses were analysed qualitatively it was seen that 4 students coming from state owned universities selected *other* choice and one selected *full scholarship* choice instead of skipping the question.

In Turkey in order to be enrolled to an industrial design undergraduate programme between 2000-2018, students either had to pass a central university entrance exam or take a special ability test depending on the institution. Depending on their score and their choice they are placed to either state owned universities or privately owned universities. State owned universities usually require higher scores. Also students enrolled with full scholarship to privately owned universities have to have very high scores. The purpose of asking this question was to determine if higher scoring students with respect to university entrance exams made up the majority of the winners in the period 2015-2020.

In our sample population it was already mentioned that 19 students out of 40 came from state owned universities. As to the status of winners coming from private universities, 14 out of 21 turned out to have studied with a full scholarship. When we add the numbers 33 (19+14) out of 40 students turn out to have relatively high scores from university entrance exams. Therefore **hypothesis # 3**, students coming from universities with central examination system, the majority of winning students have relatively high entrance exam scores was *not rejected.*

Q10: Did you get enrolled to the university by central entrance exams or special ability exams?

32 (80 percent) of the respondents were enrolled by central entrance exams and 8 (20 percent) of them were enrolled by special ability exams. Thus, **hypothesis # 2**: students coming from schools that accept students with special ability exams make up the majority of the winners *was rejected*.

Q11: How many prizes did you get from İMMİB?

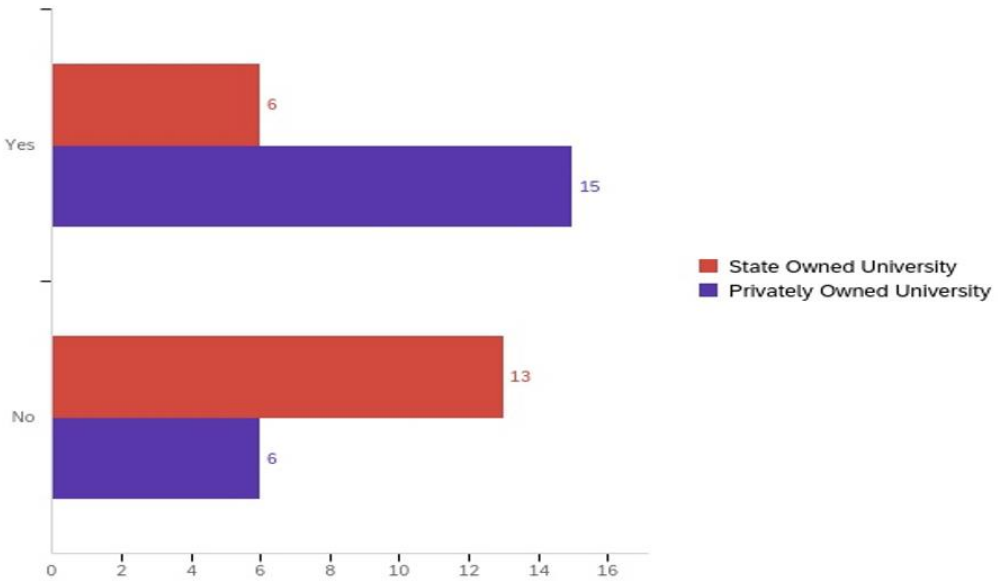
It turned out that 28 respondents got a single prize, 8 winners were awarded twice and 4 winners were awarded three times.

Q12: Did you work on the winning project as part of a course?

In total, 21 students stated that they did their projects as part of a course. 19 of the students completed their projects as an extracurricular activity. Thus **hypothesis #1** was *not rejected* and it is concluded that the majority of projects are developed during courses at universities.

An important finding related to Q12 is that there is a statistically significant relationship between Q8 and Q12. When the universities are analysed, it is seen that mostly winners coming from state owned universities worked on their own while students coming from privately owned universities completed the project within a course. Out of 21 students who said that they did the project as part of a course 15 came from privately owned universities, whereas out of 19 who completed the project as an extracurricular activity only 6 came from privately owned universities.

The difference in the ratios of *state-owned universities/privately owned* universities between positive (71.4 percent vs. 28.8 percent) and negative (31.5 percent vs. 68.5 percent)



	Yes	No
State owned university	28.6%	68.5%
Privately owned university	71.4%	31.5%

Figure 3: *Competition Project Developed as an Intra-curricular versus Extra-curricular Activity*

responses suggests that privately owned universities are more willing to include design competitions to their curriculum (Figure 2). In order to test the significance, Fisher's exact test of independence has been used. The p-value turned out to be 0.025, meaning that the hypothesis cannot be rejected. In other words, there is a statistically significant relationship between if the winner comes from a state-owned university or privately owned university and whether the project is worked as part of a course or not.

Fisher's exact test of independence is a statistical significance test used to test the significance of statistical comparisons. It is called an exact test because it identifies exactly the difference from the null or no difference hypothesis (Connelly, 2016). The test is useful for categorical data that result from classifying objects in two different ways; it is used to examine the significance of the association (contingency) between the two kinds of classification. Although in practice it is employed when sample sizes are small because it is more accurate than the chi-square test, it is valid for all sample sizes (Connelly, 2016). The Chi-square test was also applied for double-check and a significant association was repeated ($p<0,05$) (Camilli and Hopkins, 1978).

Q13: If you have developed your project within the course hours, which of the following describes best the course type?

- A studio course project
- Graduation project / Capstone course
- Course project (other than a studio course)
- Other

Out of 21 students who stated that the winning project was developed within a course 17 of the

respondents developed the project within a studio course, 2 of them worked on the project within a course other than studio course, 1 of them worked on it as a graduation project and 1 of the respondents did not specify. As it is seen, the majority (81 percent) of winners who worked on the project within school hours used studio courses for this purpose.

Conclusion

The main objective of this study is to reveal school related factors that affect İMMİB industrial design competition student category results. For this purpose, four hypotheses have been constructed:

Hypothesis #1: The majority of projects are developed during courses at universities *(supported)*.

Hypothesis #2: Students coming from schools with special ability exam make up the majority of winners *(not supported*).

Hypothesis #3: For students coming from universities with central examination system, the majority of winning students have relatively high entrance exam scores (supported).

Hypothesis #4: The older the department, the higher the frequency of winners coming from that university *(supported; correlation coefficient +0.44).*

The following section discusses the findings with respect to existing literature and elaborates on the future implications of the results.

Discussion and Future Implications

The authors of this paper found that as the number of years since the establishment of the industrial design department increased, the total number of prizes accumulated from the İMMİB student design competition also increased in the period 2015-2020. In other words, the older the industrial design department the more are the chances of winning a prize. In this respect existing literature mentions the importance of tradition as a facilitator of self-confidence: 'When it becomes an institution's tradition that teams from the institution always win awards, the current team believes it can win and it will not want the previous teams down.' (Wankat 2005, 346)

Between 2015-2020, in the total population of winners there were 23 universities represented. In the sample population we used for this study, there were 16 universities represented. Out of 16 universities, 8 were state-owned and the other 8 were privately owned universities. In Turkey, industrial design departments at state owned universities attract students having higher entrance scores. Privately owned universities on the other hand, offer full scholarship for students with higher scores. We tried to identify whether the winning students in our sample population were those with higher entrance exam scores. Indeed, 14 students enrolled to privately owned universities out of 21 had full scholarships. When we consider them together with the students coming from state owned universities (19+14= 33) 82,5 percent of students had very high entrance scores. Existing literature points out the importance of student quality on competition results: 'Most of the advisors also commented on the importance of motivated, high-quality students' (Wankat 2005, 346). The easiest and most objective way for us to assess student quality was to use university entrance exam scores together with scholarship merits and our findings support the findings of existing literature i.e. most of the prize winning students are high quality students.

Existing literature mentions the pressure on college admissions promotion (Zhang & Wang 2018). Successful student competition results are likely to be used by universities as a means of promotion because they increase a university's popularity. Also, successful student competition results are used as a proof of rigorous education particularly in departments/disciplines when accreditation is missing. Wang (2019, 4) also states that many colleges and universities use awards to promote their teaching achievements.

In the absence of a school policy dedicated to imparting the competition theme to future designers or the lack of staff members who are

qualified to guide students through the competition, the benefits of participation in such competitions may be limited (Meir et al. 1996, 306). Wankat (2005, 346) found that students who competed in the competition that was closely aligned with the curriculum were successful; on the other hand, students who participated to another competition that was not closely aligned with the curriculum did not win awards during the same period. At present, in the curriculum of some universities in China, the design competition has begun to be embedded in the industrial design teaching system (Zhang & Wang 2018, 875). Our research findings demonstrate that almost half (21/40) of the winning projects were done as part of a course, the majority (17/21) being a studio course which means that the curriculum is aligned with the competition. The dominance of privately owned universities in the group of schools who taught the competition project as part of a course was significant. 71.4 percent of the intra-curricular competition projects belong to privately owned universities. One of the possible explanations for the adoption of the competition so much could be related to the rivalry between universities in terms of admission. Since privately owned universities struggle very hard to fill in the allocated number of places with candidates having higher entrance exam scores, successful design competition results may serve them as credentials to attract higher quality students because winners enjoy nationwide recognition, they are awarded with many monetary and non-monetary benefits. Particularly the international scholarship for graduate education is a major motivating factor for students.

We discussed the preliminary results of this research with professional designers and design instructors on Industrial Designers' Day 29th June 2021 at an on-line forum entitled "Diversity in Academia" organised by Industrial Designers Society of Turkey (ETMK). The forum was moderated by two design academicians. In total, six design academicians were invited as first speakers. Each speaker presented their research on different topics related to diversity in the academy. After each speaker, the online audience participating in the forum expressed their views on the subject and asked questions to the speakers, so that each topic was discussed by the designers, design academics and students. While the second author of this research was one of the moderators, the first author presented the preliminary results of the research as a speaker. Later on the audience elaborated on the subject. The audience pointed out *ethics* and *privacy* as potential problem areas as an outcome of carrying out the competition preparation during course hours. The ethics is related to working on the project with the support of an advisor versus on your own. Privacy on the other hand is knowledge sharing with the students' peers in the class. Both issues have to be investigated as a future study focusing on the student point of view.

Existing literature suggests that winning a competition has several impacts on students such as the enhancement of student self-confidence (Wankat 2005); help in getting the first job (Wang 2019; Zhang & Wang 2018; Wankat 2005); a means of earning money (Er et al., 2021); going abroad for graduate study. In order to identify how students' lives changed after winning the competition, in depth interviews with winning students should be carried out as a future implication.

Wankat (2005, 347) suggests further research to test if well-designed student competitions increase student learning, help them learn practical aspects of engineering and motivate many students work harder. According to the authors of this paper the issue concerning if competition participation leads to an increased student learning has to be explored with detailed qualitative studies that involve students and instructors.

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References

Boyer, E. & Mitgang, L. (1996) *Building Community: A New Future for Architectural Education and Practice.* Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Camilli, G. & Hopkins, K.D., (1978) Applicability of chi-square to 2× 2 contingency tables with small expected cell frequencies. *Psychological Bulletin*, Vol. 85, No. 1, pp.163-167.

Connelly, L.M. (2016) 'Fisher's exact test', *MedSurg Nursing*, Vol. 25, No.1 (online), Available at: https://link.gale.com/apps/doc/A444912943/AONE?u=anon~762f4513&sid=googleScholar&xid=84c846ae (accessed 25 March 2022).

Çopur, M. (2017) *İMMİB Endüstrivel Tasarım Yarışmalarının Değerlendirilmesi (Evaluation of İMMİB Industrial Design Competitions).* Unpublished MSc thesis, Middle East Technical University, Ankara.

de-Juan, A., Fernandez del Rincon, A., Iglesias, M., Garcia, P., Diez-Ibarbia, A. & Viadero, F., (2016) Enhancement of mechanical engineering degree through student design competition as added value. Considerations and viability. *Journal of Engineering Design*, Vol. 27, No.8, pp.568-589.

Dilek, İ. & Kaygan, P. (2018) Different goals, different criteria: Perspectives of jury members in industrial design competitions in turkey. *A/Z ITU Journal of the Faculty of Architecture*, Vol. 15, No.3, pp.13-27.

Er, H.A., Özcan, C., Ertem, H. (2021) I'm design chat 10 memleketten tasarım manzaraları: "Tasarım Yarışmaları" (online), Available at: https://www.youtube.com/watch?v=ys-rglSUHIU (accessed 23 March 2021).

Fawcett, J., & Garity, J. (2009) *Evaluating Research for Evidence Based Practice*. Philadelphia, PA: F.A. Davis.

Frascara, J. (2002) Preface, in Frascara, J (Ed) *Design and Social Sciences: Making Connections.* London: Taylor and Francis.

Gelmez, K. (2011, December) İMMİB Endüstriyel Tasarım Yarışmaları Üzerine Bir Inceleme: 2005–2009 (An Analysis on İMMİB Industrial Design Competitions: 2005–2009), In *Endüstride, Tasarımda, Eğitimde 40 Yıl Conference*, pp. 339-353.

Gottschling, P. (2018) Where design competitions matter: Architectural artefacts and discursive events, *Journal of Material Culture*, Vol. 23, No, 2, pp.151-168.

Haupt, P., Wijas, M., Mochocka, S., & Chyb, A. (2019) Teaching architectural design through competition, motivation and challenge. *World Transactions on Engineering and Technology Education*, Vol. 17, No.3, pp. 338-342.

Hermand, S., & Rajeb, S. B. (2019, June) Using Design Competition Calls in a "Design Studio" Course. In *AMPS Conference 17.1*, pp. 167-176.

Irkdaş Doğu, D., Timur Öğüt, Ş. & Er, H.E. (2015) Characterizing industrial design education in turkey: A current synthesis for future directions. *Yedi*. Vol.14, pp. 39-50.

Kreiner, K. (2009) Architectural competitions empirical observations and strategic implications for architectural firms, *Nordic Journal of Architectural Research*, Vol. 21, No. 2/3.

Khorbotly, S. & Al-Olimat, K. (2010, October) Engineering Student-Design Competition Teams: Capstone or Extracurricular?. In *2010*

IEEE Frontiers in Education Conference (FIE), pp. F1C-1.

Lampel, J., Jha, P. P., & Bhalla, A. (2012) Test-driving the future: How design competitions are changing innovation. *Academy of Management Perspectives*, Vol. 26, No. 2, pp.71-85.

Lobo, M.L. (2005) Descriptive research is the bench science of nursing. *Western Journal of Nursing Research*, Vol. 27, No. 1, pp.5-6.

Meir, I.A., Erell, E., Etzion, Y. & Pearlmutter, D. (1996) Are design ideas competitions hitting the target? Comments on the International Design Ideas Competition for a resort hotel by the Dead Sea, Israel. *Energy and Buildings*, Vol. 23, No. 3, pp.299-306.

Nassaji, H. (2015) Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, Vol. 19, No. 2, pp.129-132.

Pasin, B. (2017) Rethinking the design studio-centered architectural education. A case study at schools of architecture in Turkey. *The Design Journal, 20(sup1),* pp. S1270-S1284.

Popovic, V. (2005) Building a Collaborative Culture between Design Research and Practice Through Graduate Education. In *Giard, J & Pijawka, D (Eds.) Proceedings of the Fourth Conference Doctoral Education in Design. 4th Doctoral Education in Design, United States of America*, pp. 119-128.

Raffeor, W. S., Pung, C. P., & Joo, S. H. (2013, June) Using The ASME Student Design Competition as the Culminating Design and Build Experience in a Freshman Level Cad-Cam Course. In *2013 ASEE Annual Conference & Exposition*, pp. 23-1341.

Ratner, B. (2009) The correlation coefficient: Its values range between +1/−1, or do they? *Journal of Targeting Measurement and Analysis for Marketing*, Vol. 17, No.2, pp. 139–142.

Salama, A. M. (2015) *Spatial design education: New directions for pedagogy in architecture and beyond*: Routledge.

Senior, B. A., & Holt, R. J. (2014) Student Perceptions about Their Participation in the ASC Regions 6 and 7 Student Competition, *50 th Annual International Conference Proceedings.*

Stebbins, R. (2001) *Exploratory Research in the Social Sciences*. Thousand Oaks, CA: SAGE, Vol. 48.

Strong, J. (1976) *Participating in architectural competitions: A guide for competitors, promotors and assessors*. London: The Architectural Press Ltd.

Toprak, İ., & Hacihasanoglu, O. (2019) Terms and Concepts on Design Studio in the Research Articles of 2010's. *Journal of Design Studio*, Vol. 1, No. 2, pp.13-22.

Volker, L. (2010, July) Designing a Design Competition: The Client Perspective, In *Durling, D., Bousbaci, R., Chen, L, Gauthier, P., Poldma, T., Roworth-Stokes, S. and Stolterman, E (eds.), Design and Complexity – DRS International Conference, Montreal, Canada*.

Wang, S. F. (2019, July) The impact of design competition on design education. In *IOP Conference Series: Materials Science and Engineering*, Vol. 573, No. 1, pp. 012060.

Wankat, P. C. (2005) Undergraduate student competitions. *Journal of Engineering Education*, Vol. 94, No. 3, pp. 343-347.

Zhang, F., & Wang, W. (2018, December) Research on the Method of Improving the Innovation Ability of Industrial Design Students Based on Design Competition. In *2nd International Conference on Art Studies: Science, Experience, Education (ICASSEE 2018)*, pp. 875-878.