Investigation of Success Levels of Visual Arts Students in Computer-Aided Design Course

Görsel Sanatlar Öğrencilerinin Bilgisayar Destekli Tasarım Dersindeki Başarı Düzeylerinin İncelenmesi

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Abstract: The aim of this research is to examine the design course end-of-semester success levels of undergraduate students studying in the visual arts department of art and design faculty and taking the computer-aided design course in terms of gender, age, having a personal computer, educational status and being employed. In this respect, the research model is a descriptive survey. For this purpose, the data obtained from 42 students were analysed with Mann Whitney U Test. Although it was concluded that male students were more successful than female students in terms of end-of-semester scores according to the gender variable, it was understood that this was not statistically significant. The result obtained from the age variable was found to be statistically significant and it was observed that students in the 25-34 age range were more successful than students in the 19-24 age range. According to the findings regarding the variable of having a personal computer, it was understood that although the average score of students who had computers was higher than those who did not, this difference was not statistically significant. According to the findings related to the educational status variable, although it was observed that the mean scores of the students studying at the second university were higher than those studying at the first university, it was concluded that this was not statistically significant. According to the findings regarding the working variable, it was determined that the average score of working students was higher than that of unemployed students, but this difference was not statistically significant. Upon overall evaluation of the findings, it has been concluded that there is a statistically significant difference in students' achievement levels only with respect to the age variable. However, the observed difference in other demographic variables is not statistically significant.

Keywords: Computer-Aided Design, Visual Arts, Success Level

Özet: Bu araştırmanın amacı sanat ve tasarım fakültesindeki görsel sanatlar bölümünde öğrenim gören ve bilgisayar destekli tasarım dersini almış lisans öğrencilerinin tasarım dersi dönem sonu başarı düzeylerini cinsiyet, yaş, kişisel bilgisayarının olma durumu, eğitim durumu ve bir işte çalışıyor olma durumu açısından incelemektir. Bu yönüyle araştırmanın modeli betimsel taramadır. Bu amaç doğrultusunda 42 öğrenciden elde edilen veriler Mann Whitney U Testi ile çözümlenmiştir. Cinsiyet değişkenine göre erkek öğrencilerin dönem sonu puanı açısından kadın öğrencilerden daha başarılı oldukları sonucu çıkmış olsa da bunun istatistiksel olarak anlamlı olmadığı anlaşılmıştır. Yaş değişkeninden elde edilen sonucun istatistiksel olarak anlamlı olduğu tespit edilmiş olup 25-34 yaş aralığındaki öğrencilerin 19-24 yaş aralığında bulunan öğrencilere göre daha başarılı oldukları gözlenmiştir. Kişisel bilgisayara sahip olma durumu değişkenine ilişkin bulgulara göre bilgisayarı olan öğrencilerin puan ortalamasının olmayanlara göre daha yüksek olmasına rağmen bu farklılığın istatistiksel olarak anlamlı olmadığı anlaşılmıştır. Eğitim Durumu değişkenine ilişkin bulgulara göre ikinci üniversitesini okuyan öğrencilerin puan ortalamalarının ilk üniversitesini okuyanlara göre daha yüksek olduğu görülse de bunun istatistiksel olarak anlamlı olmadığı sonucuna ulaşılmıştır. Bir işte çalışma değişkenine ilişkin bulgulara göre çalışan öğrencilerin puan ortalamasının çalışmayan öğrencilere göre daha yüksek olduğu ancak bu farklılığın istatistiksel açıdan anlamlı olmadığı tespit edilmiştir. Genel olarak bulgular değerlendirildiğinde öğrencilerin başarı düzeylerinde istatistiksel olarak manidar farklılığın sadece yaş değişkeni açısından ortaya çıktığı, diğer demografik değişkenler açısından gözlenen farklılığın ise manidar olmadığı sonucuna ulaşılmıştır.

Anahtar Sözcükler: Bilgisayar Destekli Tasarım, Görsel Sanatlar, Başarı Düzeyi

1. Introduction

Universities as institutions have made significant contri-

butions to the formation of modern societies. Because universities are environments where advanced education,

scientific research, inventions, and scientific knowledge are produced. Individuals trained in universities directly transfer the science and art they have learnt to social life and feed the society. Therefore, the success or failure of university students also affects social success and development. For this reason, in order to raise qualified students, it is necessary to carry out studies to eliminate the factors that contribute to and hinder their success in the education process. In recent years, many studies have been conducted in different fields related to environmental factors affecting the academic success of university students (Sarıer, 2016; Özer & Sarı, 2016; Rençber, 2012; Kurt & Erdem, 2012; Koç et al., 2004). Among these numerous studies, some variables, academic motivation, learning styles, etc. have been discussed in relation to students' academic achievement (Taşkesen et al., 2016; Bölükbaş, 2012). When the researches that are associated with a specific department, especially those that may be related to the subject of this researches are examined, it is seen that they are prepared to close the scientific resource gap in different fields. For example, there is an article examining the course success levels of graphic design students according to the high schools they graduated from (Ayçe & Sevindik, 2018), there are theses dealing with the contributions of vector-based programs used in computer-aided design education to the logo design process, and the relationship between traditional design teaching and production methods and digital design method, which is a modern design method (Yücel, 2008; Soydan, 2020).

This research started with the search for an answer to the question of what the factors are affecting the success of the students studying in the visual arts department of Art and Design Faculty in the computer-aided design course. When the literature review was made, it was seen that there was a need for such a resource in the related field. The main goal here is to identify and analyse the factors that have the potential to affect success and to make the necessary improvements.

Gender and age variables, which are important at many levels of education and are frequently used in various fields, are among the basic demographic variables. The reason why the age factor is included in the research is that human comprehension has the potential to change in different age groups. In this regard, a concept called Life Span Developmental Approach has emerged in fields such as psychology, psychiatry, anthropology, and sociology. The most important assumption of the life span developmental approach is that development is not completed in adulthood or at a certain stage of life, but continues throughout life (Eryılmaz, 2011). Gender has an important place in educational research as it is one of the important criteria (Levtov, 2014) such as equal access, equality in the education process and the rights gained after education.

Other important factors are personal computer, educational status and employment outside the university. For example, it has been emphasised that computer and its features have become a kind of necessity in visual design

courses (Güllüoğlu, 2010) and computer laboratories in educational institutions have created equal opportunities among students (Keser, 1989).

In addition, it has been stated that there has been a steady increase in the number of students studying a second university in open and distance learning (İbileme et al., 2020) and that these students need to work during their education for reasons such as standing on their own feet, coming from a low-income family and being economically inadequate, contributing to the family, and gaining experience (Aydemir et al., 2022). Apart from the above-mentioned reasons, students also tend to work and do other jobs because they do not like their department or because they want to earn more money. One of the main reasons that force students to do this is that they have low expectations of finding a job in their field (Ensari & Deniz, 1992).

When the teaching process was considered, it was thought that the relevant factors could be gender, age, personal computer, educational status and working in a job outside the university.

The purpose of this research is to examine how the end-of-semester academic achievements of undergraduate students who study in the visual arts department and have taken the computer-aided design course change in terms of gender, age, whether they have a personal computer or not, their educational status and whether they are employed.

For this purpose, answers were sought to the following research questions:

1. Does the end-of-semester academic success level of students taking the computer-aided design course at the undergraduate level differ statistically according to gender?

2. Does the end-of-semester academic success level of students taking the computer-aided design course at the undergraduate level differ statistically according to age?

3. Does the end-of-semester academic success level of students taking the computer-aided design course at the undergraduate level differ statistically depending on whether they have a personal computer?

4. Does the end-of-semester academic success level of students taking the computer-aided design course at the undergraduate level differ statistically depending on whether the visual arts department they study in is their first or second university?

5. Does the end-of-semester academic success level of students taking the computer-aided design course at the undergraduate level differ statistically depending on whether they are employed?

2. Method

2.1. Research Design

The purpose of this study was to examine the level of student achievement in relation to a number of demographic variables, and to attempt a description of the level of student achievement in the current situation. The research model was a descriptive survey. In survey research, the characteristics of a group are defined through questionnaires, tests or interview questions. Survey research is the most widely used descriptive methodology in educational research (Fraenkel et al., 2012).

2.2. Data Collection

The aim of the study is to examine the end-of-semester academic achievement levels of students taking computer-aided design courses in terms of various demographic variables. End-of-semester academic achievement includes a passing grade based on 40% midterm and 60% final weighting of student performances. The midterm and final exams are based on the scoring of student performances in class and out-of-class applications. A checklist based on the criteria of subject matter, composition, design principles, use of colour, originality and aesthetic value was used to ensure that the measurements were valid and reliable. Considering the scope of the course, the criteria in the relevant sources were utilised (Eshun & Osei-Poku, 2013; Ali *et al.*, 2015). In addition, these criteria were expanded with course-specific criteria not included in the relevant sources. From these criteria in the checklist, a general evaluation was made over a total of 100 points, including 20 points for suitability to the subject, 10 points for correct composition, 30 points for using design principles in accordance with the purpose of the study, 10 points for colour harmony, 20 points for originality of the work and 10 points for aesthetic value. These criteria and weightings were used for both midterm and final application studies. A personal information form including the gender, age, having a personal computer, education status and employment status was used to get data about the demographic variables whose effect on academic achievement was to be tested and data were collected from the students online. The academic achievement scores to be used in this study were obtained from the student information system and the necessary data were collected by creating a personal information form for demographic variables.

2.3. Study Group

In this study, gender, age, personal computer ownership, education level and employment status were considered as demographic variables. The Table 1 below presents descriptive statistics for the demographic variables used in the study.

When Table 1 is analysed, it is seen that 81% of the students in the study group are female and 19% are male. While 66.7% of the students were aged between 19-24, 33.3% were aged between 25-34. The United Nations for individuals in the youth and adult categories was taken into

consideration in the creation of these age ranges (United Nations, 2023). While 40.5% of the students have a personal computer, 59.5% do not have a personal computer. While 66.7% of the students in this study studying in the department of visual arts are in their first university experience, 33.3% of them are studying in this department as a second university. Finally, when the status of being active in business life is analysed, it is observed that 33.3% of the students are working and 66.7% are not working.

2.4. Data Analysis

In the study, it was aimed to compare the end-of-semester academic achievement levels of undergraduate students in computer aided design course in terms of various demographic variables such as gender, age, having a personal computer or not, educational status and working in a job other than university. Since the number of groups to be compared in terms of all independent variables in the study was two, it was considered to compare the averages of the groups with independent samples t test. However, when the number of observations at the levels of the variables was analysed, it was observed that the observations at the levels of all variables except the variable of having a personal computer was below 15. In addition, the normality of the levels of each variable was examined with the Shapiro wilk test and the results are presented in the Table 2.

When Table 2 is analysed, it is observed that the results re-

Table 1. Descriptive Statistics on Demographic Variables

Variable		Frequency (f)	%
Gender	Female	34	81,0
	Male	8	19,0
Age	19-24	28	66,7
	25-34	14	33,3
Having a personal computer	Yes	17	40,5
	No	25	59,5
Education status	First university	28	66,7
	Second university	14	33,3
Employment status	Yes	14	33,3
	No	28	66,7

Table 2. Shapiro Wilk Normality Test Results

Variable		Statistics	df	p-value
Gender	Female	0,866	34	0,001
	Male	0,920	8	0,429
Age	19-24	0,864	28	0,002
	25-34	0,935	14	0,355
Having a personal computer	Yes	0,854	17	0,012
	No	0,938	25	0,135
Education status	First university	0,966	28	0,470
	Second university	0,864	14	0,035
Employment status	Yes	0,978	14	0,962
	No	0,919	28	0,033

lated to the levels of each variable have p-values less than 0.05. This result shows that the distribution of the sample deviates from normality and therefore the normality assumption is violated. In addition to the small number of observations in the levels of the variables in the study, it was observed that there was a violation of the normality assumption, and it was decided that it would be appropriate to use the Mann Whitney U Test, one of the nonparametric tests, to compare independent groups for the purpose of the research. The Mann Whitney U test is used to test whether the scores obtained from two independent groups differ significantly from each other and is the non-parametric equivalent of the independent samples t test (Field, 2005).

3. Findings

3.1. Descriptive statistics

The Table 3 shows the mean and standard deviation values for the levels of each variable.

Table 3. Descriptive Statistics Regarding end-of-semester academic achievement Scores in Terms of Demographic Variables

	Source of variance	N		SS
Gender	Female	34	76,41	12,33
	Male	8	80,88	10,87
Age	19-24	28	74,07	12,03
	25-34	14	83,64	9,64
Having a personal computer	Yes	17	79,06	16,22
	No	25	76,04	8,34
Education status	First university	28	77,32	9,12
	Second university	14	77,14	16,92
Employment status	Yes	14	80,57	7,62
	No	28	75,61	13,59

When the Table 3 is analysed, it is observed that the mean scores of female students are higher than male students. When the age variable is analysed, it is seen that the average of the individuals between the ages of 25-34 is higher than the individuals between the ages of 19-24. When the status of having a personal computer was analysed, it was observed that the students who had a computer resulted in higher end-of-term scores. In terms of the educational status variable, it is concluded that the averages of the individuals with a first university education and those with a second or higher university education are very close to each other, but the average of the students who studied at their first university is higher. Finally, when analysed in terms of the employment status variable, it is seen that the average end-of-semester achievement of the students who are not working in any job is lower than the students who are working in a job outside the university. In order to test the statistical significance of the differences observed in the variables, Mann Whitney U tests were used, and the results were presented in the tables and interpretations were made.

3.2. Findings Regarding the Gender Variable

The results of the analyses made to examine how the end-of-semester scores of undergraduate students in the computer aided design course change statistically according to gender are presented in the table:

Table 4. Mann Whitney U Test Results of Undergraduate Students' End of Semester Grades According to Gender

	n	Mean Rank	Sum of Ranks	U	p
Female	34	21,10	717,50	122,50	0,665
Male	8	23,19	185,50		

When the results in Table 4 are analysed, it is seen that the mean ranks of male students' end-of-semester achievement scores are higher than female students, but the scores of female and male students do not differ significantly from each other (U=122,50; p>.05). This situation shows that the end-of-semester achievement scores of the students do not depend on gender, so the end-of-semester achievement levels of female and male students in the computer-aided design course are similar.

3.3. Findings Regarding the Age Variable

The results of the analyses conducted to examine the statistical variation of undergraduate students' end-of-semester score in the computer aided design course according to age are presented in the table:

Table 5. Mann Whitney U Test Results of Undergraduate Students' End-of-Semester Scores According to Age

Age	n	Mean Rank	Sum of Ranks	U	p
19-24	28	17,79	498,00	92,00	0,005*
25-34	14	28,93	405,00		

*p<.05

When Table 5 is analysed, it is observed that the end-of-semester achievement scores of the students between the ages of 19-24 and 25-34 differ significantly from each other (U=92,00; p<.05). When the mean ranks are examined, it is seen that this difference is in favour of the students between the ages of 25-34. This result indicates that the achievement level of the students between the ages of 25-34 in the computer-aided design course is statistically higher than the students between the ages of 19-24. In other words, it can be said that the students in the adult group have a higher level of success than the students in the young group.

3.4. Findings Regarding the Variable of having a Personal Computer

The results of the analyses made to examine how the end-of-semester achievement scores of undergraduate students in the computer aided design course change statistically according to the status of having a personal computer are presented in the table:

Table 6. Mann Whitney U Test Results on End-of-Semester Scores of Undergraduate Students According to Owning a Personal Computer

	n	Rank Mean	Sum of Ranks	U	p
Yes	17	25,21	428,50	149,50	0,106
No	25	18,98	474,50		

When the results in Table 6 are analysed, it is seen that the mean rank of the students who have personal computers are higher than the students who do not have personal computers, but the scores of the students with and without personal computers do not differ significantly from each other (U=149,50; p>.05). This situation shows that the end-of-semester achievement scores of the students do not depend on having a personal computer, therefore, the end-of-semester achievement levels of the students with and without a personal computer in the computer-aided design course are similar.

3.5. Findings Regarding the Educational Status Variable

The results of the analysis conducted to examine how the end-of-semester scores of undergraduate students in the computer aided design course change statistically according to whether the undergraduate programme they are studying is the first university or the second university are presented in the table:

Table 7. Mann Whitney U Test Results on End-of-Semester Scores of Undergraduate Students According to Whether It is Their First or Second University

	n	Rank Mean	Sum of Ranks	U	p
First University	28	20,77	581,50	175,50	0,584
Second University	14	22,96	321,50		

When the results in Table 7 are analysed, it is seen that the mean rank of the students who are currently studying visual arts as the second university is higher than the students who are currently studying visual arts as the first university, but the scores of the students studying at the first university and the students studying at the second university do not differ significantly from each other (U=175,50; p>.05). This situation shows that the end-of-semester achievement scores of the students do not depend on the education status in terms of being the first or second undergraduate education, therefore, the end-of-term achievement levels of the students studying at the first university and the second university in the computer-aided design course are similar.

3.6. Findings Regarding the Variable of Working at a Job

The results of the analyses conducted to examine how the end-of-semester scores of undergraduate students in the computer aided design course change statistically according to whether they are working outside the university or not are presented in the table:

Table 8. Mann Whitney U Test Results on End-of-Semester Scores of Undergraduate Students According to Working Status Outside the University

	n	Rank Mean	Sum of Ranks	U	p
Yes	14	24,68	345,50	151,50	0,234
No	28	19,91	557,50		

When the results in Table 8 are examined, it can be seen that the end-of-semester achievement level of students who work in any job in addition to their undergraduate education is higher than that of students who do not work in any job, but the scores of students who work in a job and those who do not work do not differ significantly from each other (U=151.50; p>.05). This shows that students' end-of-semester achievement scores do not depend on whether they are working or not, and therefore, the end-of-semester success levels of working and unemployed students in the computer-aided design course are similar.

4. Discussion and Conclusion

In the study, the end of semester achievement scores of the students in computer-aided design course were analysed in terms of gender, age, having a personal computer, being a first or second university according to their undergraduate education and having a job. The change of students' end of semester achievement scores according to each variable was analysed by Mann-Whitney U test and according to the results obtained, it was seen that there was a significant difference between young and adult individuals in terms of age variable. No significant difference was observed between the groups in terms of other variables.

In the research, it was understood that there was no gender-based difference among the students taking the computer-aided design course. Some studies on the gender factor also support this result (Bahar & Yıldırım, 2017; Arslan & Babadoğan, 2005, Magolda, 1989).

The results obtained in terms of age variable showed that the achievement level of the students between the ages of 25-34 was statistically higher than the achievement level of the students between the ages of 19-24. According to IDA (2023), there are many differences between students categorised as adults and students categorised as youth, such as self, physical response, life experience, time, learning and motivation. Adults live independently, while young people live in a more dependent way. In terms of learning, adults can usually decide for themselves what to learn, whereas young people need guidance from a teacher or tutor. Adults generally know their responsibilities, whereas young people are told what to do. Zahn (1967) states that adults can associate time with the present and daily life, but young people approach time more abstractly and that adults have more accumulated experiences in terms of life experience than young people. The situations mentioned here support the results of the research. In addition, in an article investigating the effects of education, age and gender on the unemployment rate, it is stated that unemployment is highest

among young people in the 15-19 and 20-24 age groups. In the study in which the data of the population in Turkey between 2005-2019 were analysed, it was found that the unemployment rate in the adult category was lower (Cinel & Yolcu, 2021). In this respect, it can be said that there is a relationship between the research on the success in the computer-aided design course and the research that basically examines unemployment in terms of the age factor.

The results of the study showed that the difference between the end of semester achievement scores of the students who had personal computers and the students who did not have personal computers was not significant. The reason underlying this situation may be related to the computer laboratories established under the roof of the institution which leads to eliminate the inequality between the students in terms of the equipment. Because Keser (1989) states that computer laboratories in educational institutions create equality of opportunity among students.

One of the reasons why there is no significant difference in the success of the students studying at the second university in the design course in the context of educational status can be attributed to the fact that the department at the first university does not support the department at the second university. In general, students tend to choose the second department because they are dissatisfied with their first one, or they have problems in being appointed. (Kiraz, 2014).

Lastly, no significant difference was found between the students who had a job during their education and those who did not. However, when the studies are examined, it is observed that having a job has the potential to have a negative effect on achievement (Aydemir et al. 2022; Gökkaya, 2021). In this study, although there was no significant difference, when the averages were compared, it was observed that working students had a higher average achievement. One of the reasons for this may be the small sample size of this study. Moreover, there could be other factors related to the fact that the students worked part-time, or they maintain their work as mini jobs.

Finally, of all the variables in the study, only the age variable was found to be significantly different. This difference may be due to the physical and mental development of the students in the category of young people and the category of adults.

Research Ethics

Ethics Committee Approval: Ethics committee approval for this study was obtained from the Social and Human Sciences Ethics Committee of Dicle University with the decision dated 25.05.2023 and numbered 483681.

Author Contributions

The author has accepted full responsibility for this article and approved its submission.

Competing Interests

The author has declared that there are no conflicts of interest.

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References

Ali, M.M., Atef, H., & El-Din, K. (2015). Developing Assessment Rubric in Graphic Design Studio-Based learning: Experiments in Active Teaching in a Case Study. *International Design Journal*, *5*(3), 1245-1255.

Ayçe, M. T. & Sevindik, O. (2018). Grafik Tasarım Programı Öğrencilerinin Ders Başarı Düzeylerinin Mezun Oldukları Liselere Göre Değerlendirilmesi. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, *6*(1) , 67-73. https://doi.org/10.18506/anemon.266023

Arslan, B., & Babadoğan, C. (2005). İlköğretim 7. ve 8. sınıf öğrencilerinin öğrenme stillerinin akademik başarı düzeyi, cinsiyet ve yaş ile ilişkisi. *Eurasian Journal of Educational Research*, *21*(14), 35-48.

Aydemir, İ., Ünal, V., Öngören, B., Bıyık, T., Uluocak, N. N., Topçu, R., Özdemir, E. (2022). Problems Faced by Working Higher Education Students, *Journal of University Research, 5*(3), 276-285. https://doi.org/10.32329/uad.1060624

Bahar, H. H., & Yıldırım, S. (2017). An Investigation Faculty of Economics and Administrative Sciences Students' Learning Styles with Success According to Gender, Program and Class Level. *The Journal of Selcuk University Social Sciences Institute, 38*, 14-27.

Bölükbaş, F. (2012). Türkçe Öğretmeni Adaylarının Öğrenme Biçemleri ile Akademik Başarıları Arasındaki İlişki [The Relationship Between Learning Styles and Academic Achievement of Prospective Turkish Teachers]. *Hayef Journal of Education*, *4*(2), 49-64.

Cinel, E. A. ve Yolcu, U. (2021). Eğitim, Yaş Ve Cinsiyetin İşsizlik Oranı Üzerindeki Etkileri: Türkiye Örneği, [The Impacts Of Education, Age And Gender On Unemployment Rate: The Case Of Turkey], *Electronic Journal of Social Sciences*, *20*(78), 844-858, https://doi.org/10.17755/esosder.839361

Ensari, H. & Deniz, L. (1992). Üniversite Gençliğinin İş Beklentileri ve Part-Time Çalışma Alışkanlıkları, *Marmara Üniversitesi Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi*, *4*(4), 59-64.

Eryılmaz, A. (2011). Yaşam boyu gelişim yaklaşımı. *Psikiyatride Güncel Yaklaşımlar*, *3*(1), 49-66.

Eshun, E. F., & Osei-Poku, P. (2013). Design Students Perspectives on Assessment Rubric in Studio-Based Learning. *Journal of University Teaching & Learning Practice*, *10*(1). https://doi.org/10.53761/1.10.1.8

Field, A. P., Miles. (2005). *Discovering statistics using SPSS* (2nd ed.). London: Sage.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: Mc Graw Hlll.

Gökkaya, F. (2021). *Çalışan Üniversite Öğrencilerinin Finansal Durumları, Çalışma Nedenleri Ve Koşulları İle Akademik Başarılarının Araştırılması* (Yüksek Lisans Tezi). [Investigation of Financial Situations, Working Reasons and Conditions and Academic Success of Working University Students (Master's Thesis)]. Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Bankacılık ve Finans Anabilim Dalı, Isparta.

Güllüoğlu, S. (2010). Bilgisayar Destekli Eğitimin Mesleki Gelişimdeki Önemi, [The Importance of Computer Aided Education in Professional Development], *AJIT-e: Academic Journal of Information Technology,1*(1),0-0. https://doi.org/10.5824/1309-1581.2010.002.x

İbileme, A. İ., Çınar, E., & Kaya, H. Y. (2020). Açık ve uzaktan öğrenmede ikinci üniversite öğrencilerinin yıllara göre değişiminin incelenmesi: Anadolu Üniversitesi örneği. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi, 6*(1), 63-77.

Instructional Design Australia (IDA). (2023). Designing Learning for Youth Audiences, *Differences between adult and youth learning*, https://instructionaldesign.com.au/designing-learning-for-youth-audiences/ Erişim tarihi: 31.10.2023

Keser, H. (1989). Türk Okul Sisteminde Bilgisayarların Kullanılması. *Ankara University Journal of Faculty of Educational Sciences (JFES), 22* (1), 189-224. https://doi.org/10.1501/Egifak_0000000882

Kiraz, Z. (2014). *Türkiye'de Öğretmenlerin İşsizliği Ve Ataması Yapılmayan Öğretmenler Hareketinin Çözümlemesi, [Unemployment of teachers in Turkey and analysis of unassigned teachers' act].* Doctorate Dissertation, Ankara University

Koç, M., Avşaroğlu, S., & Sezer, A. (2004). Üniversite Öğrencilerinin Akademik Başarıları ile Problem Alanları Arasındaki İlişki. [The Relationship Between Academic Achievement and Problem Areas of University Students]. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 11*, 483-498.

Kurt, Ç., & Erdem, O. A. (2012). Öğrenci Başarısını Etkileyen Faktörlerin Veri Madenciliği Yöntemleriyle İncelenmesi [Discovering the Factors Effect Student Success Via Data Mining Techniques]. *Politeknik Dergisi, 15*(2), 111-116.

Levtov, R. G. (2014). *Addressing gender inequalities in curriculum and education: review of literature and promising practices to inform education reform initiatives in Thailand.* The World Bank

Magolda, M. B. B. (1989). Gender differences in cognitive development: an analysis of cognitive complexity and learning styles. *Journal of College Student Development, 30*, 213–220

Özer, H., & Sarı, A. (2016). Kovaryans Analizi Modelleriyle Üniversite Öğrencilerinin Başarılarını Etkileyen Faktörlerin Belirlenmesi: Atatürk Üniversitesi İİBF Öğrencileri İçin Bir Uygulama [Determination of the Factors Influencing the Success of the Undergraduates by a Covariance Analysis Model: An Application for the Students of the Faculty of Economic and Administrative Sciences (Feas), Atatürk University]. *Dokuz Eylül Üniversitesi İktisadi İdari Bilimler Fakültesi Dergisi, 24*(2), 105-126.

Rençber, B. A. (2012). Üniversite Öğrencilerinin Akademik Başarılarını Etkileyen Faktörler [Factors Which Affect Academic Achievement of University Students], *Çankırı Karatekin Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 3*(1), 191-198.

Sarıer, Y. (2016). Türkiye'de öğrencilerin akademik başarısını etkileyen faktörler: Bir meta-analiz çalışması. *Hacettepe üniversitesi eğitim fakültesi dergisi, 31*(3), 609-627. https://doi.org/10.16986/HUJE.2016015868

Soydan, O. (2020). *Sanat ve tasarımda bilgisayar destekli tasarım programlarının kullanımı, [Use of computer aided design programs in art and design].* Master of Arts Dissertation, Eskişehir Osmangazi University

Taşkesen, O., Yılmaz, M., & Taşkesen, S. (2016). Güzel Sanatlar Eğitimi Bölümü Öğrencilerinin Bazı Değişkenlere Göre Akademik Motivasyonları ile Akademik Başarıları Arasın-daki İlişkinin İncelenmesi [A Study on Department of Fine Arts Education Students' Level of Academic Motivation according to Some Variables the Relation between Their Academic Motivation and Academic Success]. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi, 18*(2), 1056-1072. https://doi.org/10.17556/jef.62310

United Nations (UN). (2023). *Who Are the Youth? Global Issues,* Youth https://www.un.org/en/global-issues/youth#:~:text=For%20statistical%20purposes%2C%20however%2C%20the,of%2015%20and%2024%20years. Erişim tarihi: 06.06.2023

Yücel, A. (2008), *Bilgisayar destekli tasarım eğitiminde vektörel çizim programlarının amblem ve logo (logotype) tasarımlama sürecine katkısı, [Contribution of vectoral drawing programmes to designing process in computer based design training].* Master of Arts Dissertation, Ondokuz Mayıs University

Zahn, J. C. (1967). Differences Between Adults and Youth Affecting Learning. *Adult Education, 17*(2), 67–77. https://doi.org/10.1177/074171366701700202

APPENDIX

Online survey

1) How old are you?
2) What gender are you?
3) Do you have a personal computer?
4) Are you employed?
5) Is .... University the first university you studied at?