



EFFECT OF ABSENTEEISM AND HOMEWORK ON ACADEMIC ACHIEVEMENT OF STATISTIC LESSON

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Abstract: The aim of this study was to determine the effect of absenteeism and homework on academic achievement of statistic lesson given to Agricultural Faculty students. The data of this study was consist of 2407 individual records. To analyze the data Kruskal-Wallis H test and Mann-Whitney U test were used for the posterior test. To obtain the odds-ratio Generalized Estimating Equations were used. After three missing lesson success probability decreased to 85.1% and each missing lesson on that value decreased the probability of achievement 15.2%. Making only one homework increased the achievement 2.5 times. The second homework had 2.44 times effect on achievement according to one homework. The third and fourth homework had an effect of 1.46 and 1.85 times according to previous number of homework, respectively. The result of this study showed the decreasing academic achievement by increasing absenteeism. It is clearly seen that homework increases academic success. More homework bring more success. It should not be overlooked that the contribution of each increase in the number of homework to academic success is decreasing.

Keywords: Lesson of statistic, Absenteeism, Homework, Academic achievement, Generalized estimating equations

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1. Introduction

The last few decades the importance of statistic education have highlighted that focused on two main goals which are: to prepare all students to use statistics in their daily life and to prepare some students to academic career (Jairaman et al., 2016). Statistics as a subject in higher education necessary to process and to interpret data, usually as part of research subject that involves the decision making and data analysis routine (Irdiyansyah et al., 2018). Statistical data literacy as the ability to understand and critically evaluate statistical information with the ability to apprehend statistical thinking in various life decisions (Jairaman et al., 2016). The goal of statistics education is to produce statistically literate adults who appropriately use statistical thinking. Statistics is the only discipline where it is perhaps accepted and expected that students can learn what they need in one introductory course (Ramirez et al., 2012). Data literacy has become valuable skill for all scientific areas. Statistic is a tool for data literacy and is often taught in university to help the students to deal with obtained data in their research project. Statistics is a powerful and only tool for data processing and interpretation of the results. It supports students to conduct the research as a requirement to get bachelor degree (Irdiyansyah et al., 2018).

The academic performance of university students can be affected by many factors. There are many studies

attempted to identify the factors effecting academic performance. Some studies were conducted to investigate the effect of various factors such as school related factors, social and sociological factors, socioeconomic factors, instructional factors and some factors related to absence or doing homework (Tamiru, 2000; Pongpullponsak and Khunprom, 2007; Gottfried, 2009; Jæger, 2011; Tinajero et al., 2012).

Missing the school by students for a variety of reasons, including injury, illness, truancy, expulsion and suspension. Being absent from lesson has been found to be detrimental to learning and academic achievement. Truant students receive fewer hours of instruction and may consequently perform academically more insufficient on exams. There is a strong correlation between absences and negative outcomes such as poor academic performance (Gottfried, 2009; Eide et al., 2017).

Homework is defined as academic tasks assigned by teachers to be done by students outside of the instructional time (Cooper et al., 2012). Homework improves students' academic achievement (Kalenkoski and Pabilonia, 2017; Onder and Abaci, 2020). Positive effects of homework on learning and achievement are greatly presumed in all educational levels with higher grades and lower failure rates (Bembenutty and White, 2013; Grodner and Rupp, 2013). Some researchers argued that homework increase the Self-regulation of learning which refers to learners maintaining motivation,



setting goals, and controlling their actions, beliefs, and behaviors in order to attain important academic goals and it is associated with students' self-efficacy for learning and intrinsic motivations (Zimmerman, 2008; Kitsantas and Zimmerman, 2009; Bembenutty and White, 2013).

The aim of this study was to determine the effect of absenteeism and homework on academic achievement of statistic lesson with six years data on nine department of Agricultural Faculty of Ondokuz Mayıs University.

2. Materials and Methods

The data of this study was consist of 2407 records obtained from statistic lessons between the years of 2009 and 2014 on nine departments (Agricultural Machiney (DAM), Agricultural Biotechnology (DAB), Field Crops (DFC), Animal Science (DAS), Plant Protection (DPP), Agricultural Structures and Irrigation (DASI),

Horticulture (DH), Agricultural Economics (DAE) and Soil Science and Plant Nutrition (DSS)) of Agricultural Faculty of Ondokuz Mayıs University (Table 1).

The Department of Agricultural Biotechnology was created in 2019, thus there is no repeated student in that year. The dependent variable was academic achievement (success (0) and fail (1)) in binary structure. Explanatory variables were department (9 category), enrollment status (first and repeat), absenteeism (0-14 lessons), and number of homework (0-4). Same lecturer gave the statistic lesson with same academic program (Table 2) to all departments between the years of 2009 and 2014. So, there was no lecturer of schedule effect on the students. Four homework was given to the students; two of them was given before mid-term exam and two of them was given after mid-term exam. 30% of the homework and 70% of exams was used to calculate the academic standing.

Table 1. Number of students enrolled to statistic lesson

		2009	2010	2011	2012	2013	2014
DAM	First	24	23	26	4	8	9
	Repeat	10	12	3	14	35	27
DAB	First	30	34	36	32	37	43
	Repeat		15	23	2	27	39
DFC	First	29	27	25	29	36	37
	Repeat	7	9	19	4	29	37
DAS	First	22	17	20	10	22	22
	Repeat	11	22	19	8	22	19
DPP	First	30	31	29	37	40	40
	Repeat	5	3	2	18	27	20
DASI	First	28	27	26	15	6	5
	Repeat	11	2	5	27	35	21
DH	First	38	31	33	34	40	44
	Repeat	9	4	8	37	46	29
DAE	First	30	35	35	36	33	37
	Repeat	11	17	13	9	22	32
DSS	First	23	23	28	34	16	16
	Repeat	10	18	17	3	26	25

Table 2. Academic program of statistic lesson

Week	Content
1	Basic statistical terms and data structures
2	Data classification and graphs
3	Central tendency measures
4	Distribution measures
5	Discrete probability distributions (Binomial and Poisson)
6	Continuous distribution (Normal and Standard Normal)
7	Confidence intervals
8	Mid-term exam
9	Hypothesis tests (Z and t)
10	Hypothesis tests (Z and t)
11	Chi-Square test (lack of fit)
12	Chi-Square test (Independency)
13	Simple linear regression
14	Correlation

Because of all the data consist of discrete variables non-parametric test applied to analyze the data. To analyze the data Kruskal-Wallis H test was used to compare the groups and Mann-Whitney U test was used for posterior test. To obtain the odds-ratio Generalized Estimating Equations (GEE) were used instead of Logistic Regression because GEE can analyze data that are collected in clusters where observations within a cluster may be correlated but observations in separate clusters are independent (Onder, 2016).

3. Results and Discussion

Results showed that there is no statistical differences ($P>0.05$) among the years on the academic achievement. Effect of the department was statistically significant ($P<0.05$) on the academic achievement (Table 3) according to the Kruskal-Wallis H test. The most successful department in spite of statistic lesson was found as department of Plant Protection and the worst one was the department of Soil Science and Plant Nutrition.

Table 3. Academic achievement for the departments (Median: Min-Max)

Departments	Academic achievement
DAM	1: 0-1 ^{bcd}
DAB	1: 0-1 ^{bcd}
DFC	1: 0-1 ^b
DAS	1: 0-1 ^{cd}
DPP	0: 0-1 ^a
DASI	1: 0-1 ^{bc}
DH	1: 0-1 ^b
DAE	1: 0-1 ^b
DSS	1: 0-1 ^d
Sig.	<0.001

a,b: the different letters in the same column shows the statistical differences ($P<0.05$).

The differences among the department may be caused by the score type of university admission test. Successful departments such as DPP, DH, DAE and DFC gets student on the score type of science and mathematics, other ones gets student on the score type of literacy and science. Another reason may be the popularity of the department because succeeding student generally preferred that departments according to their university admission test results.

Enrollment status had also significant effect ($P<0.05$) on the academic achievement that the students enrolled in the course for the first time were more successful than repeated students. When the odds-ratio was examined achievement of first time enrolled students were 3.3 times higher than the repeated students. This situation may be caused by absenteeism of repeated students. Results showed that the number of missing lesson of first time enrolled students was approximately 3 ± 1 lessons where repeated students value was 12 ± 1 lessons. That is

repeated students miss the lesson four time more than first time enrolled students.

Absenteeism was significantly affect ($P<0.05$) the academic achievement that success decreases as absenteeism increases. After three missing lesson success probability decreased to 85.1% and each missing lesson on that value decreased the probability of achievement 15.2%. After eight missing lesson there was no success probability. Kendal's Tau correlation was obtained as -0.372 between absenteeism and academic achievement, which expressed 37.2% of academic achievement can be explained by absenteeism.

GEE results showed that the made number of homework had significant effect ($P<0.05$) on academic achievement. Making only one homework increased the academic achievement 2.5 times. The second homework had 2.44 times effect on academic achievement according to one homework. The third and fourth homework had effect of 1.46 and 1.85 times according to previous number of homework, respectively.

4. Conclusion

Statistics as a valuable subject in higher education necessary to process and to interpret data. One important issue of statistics is how the research could create meaningful conclusion, which is highly important for students aimed to academic carrier.

As mentioned by Gottfried (2009) and Eide et al. (2017), result of this study showed the decreasing academic achievement by increasing absenteeism. To solve this great problem that each missing lesson decreased the probability of achievement 15.2%, the students can be motivated that statistics are not a difficult subject and they have an important place in life success in the first lessons.

It is clearly seen that homework increases academic success. More homework bring more success. It should not be overlooked that the contribution of each increase in the number of homework to academic success is decreasing. In this study only four homework were evaluated. Effect of more homework can be examined in future studies for statistic lesson.

Author Contributions

The percentage of the author(s) contributions is presented below. All authors reviewed and approved the final version of the manuscript.

	H.Ö.
C	100
D	100
S	100
DCP	100
DAI	100
L	100
W	100
CR	100
SR	100
PM	100
FA	100

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition.

Conflict of Interest

The author declared that there is no conflict of interest.

Ethical Consideration

The necessary permissions was taken from the Social and Human Sciences Research and Publication Ethics Committee of Ondokuz Mayıs University (Approve date: October 10, 2023 and protocol code: 2023-17).

References

- Bembenutty H, White MC. 2013. Academic performance and satisfaction with homework completion among college students. *Learn Indiv Differ.* 24: 83-88. <https://doi.org/10.1016/j.lindif.2012.10.013>
- Cooper H, Steenbergen-Hu S, Dent AL. 2012. Homework. In KR Harris, S Graham and T Urdan (Eds.), *APA educational psychology handbook*, Vol. 3: Application to learning and teaching. American Psychological Association, Washington, US, pp: 475-495. <https://doi.org/10.1037/13275-019>
- Eide ER, Fillmore I, Showalter MH. 2017. Student absences and academic achievement. *J Stud Educ*, 7(4): 156-172.
- Gottfried MA. 2009. Excused versus unexcused: How student absences in elementary school affect academic achievement. *Educ Eval Policy Anal*, 31(4): 392-415.

- <https://doi.org/10.3102/0162373709342467>
- Grodner A, Rupp NG. 2013. The role of homework in student learning outcomes: Evidence from a field experiment. *J Econ Educ*, 44(2): 93-109. <https://doi.org/10.1080/00220485.2013.770334>
- Irdiyansyah I, Wulandari AD, Gharadila LA. 2018. Statistics learning improvement: The power of lesson study. *Adv Soc Sci Educ Human Res*, 253: 367-370.
- Jæger MM. 2011. Does cultural capital really affect academic achievement? New evidence from combined sibling and panel data. *Sociol Educ*, 84(4): 281-298. <https://doi.org/10.1177/0038040711417010>
- Jairaman K, Zamri SNABS, Rahim SSBA. 2016. A pre-service mathematics teacher's subject matter knowledge of the mode: A case study. *Malaysian Online J Educ Sci*, 4(3): 1-11.
- Kalenkoski CM, Pabilonia SW. 2017. Does high school homework increase academic achievement? *Educ Econ*, 25(1): 45-59. <https://doi.org/10.1080/09645292.2016.1178213>
- Kitsantas A, Zimmerman BJ. 2009. College students' homework and academic achievement: The mediating role of self-regulatory beliefs. *Metacognition Learn*, 4: 97-110. <https://doi.org/10.1007/s11409-008-9028-y>
- Onder H, Abaci SH. 2020. Determination of the factors affecting success in lesson of experimental design and analysis. *BSJ Pub Soc Sci* 3(1): 5-9.
- Onder H. 2016. Comparative study of generalized estimating equations and logistic regressions on different sample sizes and correlation levels. *Commun Stat Simul Comput*, 45: 3528-3533. <https://doi.org/10.1080/03610918.2015.1010000>
- Pongpullponsak A, Khunprom W. 2007. The studying mathematics achievement Title: The statistic of students in high school level who gotten the teaching in the pattern of student's thinking. The 1st International Conference on Educational Reform 2007, November 9-11, 2007, Mahasarakham, Thailand, pp: 320-328.
- Ramirez C, Schau C, Emmioğlu E. 2012. The importance of attitudes in statistics education. *Stat Educ Res J*, 11(2): 57-71.
- Tamiru M. 2000. Factors affecting academic achievement of students at bole senior secondary school. *Ethiopian J Educ*, XX(1): 25-42.
- Tinajero C, Lemos SM, Araújo M, Ferraces MJ, Páramo NF. 2012. Cognitive style and learning strategies as factors which affect academic achievement of Brazilian university students. *Psicologia: Reflexão e Crítica* 25(1): 105-113.
- Zimmerman BJ. 2008. Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educ Res J*, 45: 166-183. <https://doi.org/10.3102/0002831207312909>