

Determining the Tendencies of Academic Dishonesty and Senses of Self-efficacy with Discriminant Analysis

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ABSTRACT Academic dishonesty and self-efficacy are two complementary terms. It is quite necessary both for students and the education system that teachers perform their jobs in a productive and effective way. Teachers' professional and personal characteristics substantially influence how well teachers perform their jobs. The purpose of the study was to investigate how accurately prospective teachers' tendencies of academic dishonesty and senses of self-efficacy are classified according to their grades from 1st to 4th. Except for the first grade, prospective teachers' mean scores on the academic dishonesty tendency scale were higher than those on the self-efficacy scale. The first function but not the second function was effective in discriminating among groups. In total, 48.3 percent of the 234 prospective teachers were discriminated accurately.

INTRODUCTION

Education is the process of changing individuals' behaviours deliberately through their own experiences (Erturk 1972). In this process both positive and negative behaviours can be observed in individuals. Examples of positive behaviours include completing homework in time, taking care of friends, school tools and equipment, and obeying school rules. Examples of negative behaviours include doing homework late, failing to bring lesson materials and tools to class, damaging school equipment, and absenteeism. Among these negative behaviours the one attracting the most attention is cheating.

Academic dishonesty is a concept covering both copying/cheating and plagiarism (McCabe and Pavela 2000; Godde 2001). The term copying/cheating is defined in the TDK Turkish dictionary (1997) as the representation of a work of art or a written text, or piece of paper prepared to look at secretly during exams against the rules. To copy or cheat (generally in written exams) was defined as looking secretly to a source to find the answers against the exam rules. Pavela (1978)

defines plagiarism as one's reproduction or adaptation of ideas, words, or statements of others as if it were his/her own without crediting the exact sources (as cited in Aluede et al. 2006). Plagiarism is defined in the Big Turkish Dictionary (1988) as appropriating a work completely or partially to oneself, theft of utterance or sentence, or literary theft. Plagiarism is the use of another's work, words, or ideas without attribution (Yale University 2014).

Academic dishonesty can be experienced in every stage of formal education. Academic dishonesty is becoming more and more prevalent and students regard it as a normal practice. Bushweller (1999) reported that students are specialized in cheating when they are in 7th grade, improve this practice strikingly when they are at a university, and that only very careful teachers can detect the practice of academic dishonesty. Many research findings indicate that the practice of cheating has increased rapidly recently (Paldy 1996; Bekaroglu 2002; Semerci 2004; Roig and Casso 2005; Semerci and Saglam 2005; Bouville 2010).

Self-efficacy is related to how effective individuals consider themselves in their occupations, and the extent to which they possess the requirements of that occupation. Self-efficacy is defined by Bandura (1986) as an individual's judgements about his/her capacity to organise and successfully perform the activities required, and contributes to the individual's behaviours. Tschannen-

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Moren and Woolfolk-Hoy (2001) define self-efficacy as an individual's expectations of himself/herself regarding his/her level of achievement in response to a new situation. Gist and Mitchell (1992) explain self-efficacy as not an innate capacity, but a personal judgement about one's capacity of performance in a task.

Considering the definitions about self-efficacy, it can be inferred that one's sense of self-efficacy does not reflect the actual situation about his/her job performance, but the beliefs in the ability to perform the task. Individuals with considerable self-efficacy know what activities they can perform, how much effort to spend, how to overcome challenges, and how much anxiety or confidence to experience (Koc 2003).

The professional and personal characteristics of teachers strongly influence whether or not they perform their jobs effectively. These characteristics are also considered to be very important in teacher education, because teachers are important role models for students' character development. Unfavourable personality traits of a teacher can cause academic failure and educational trauma in students; teachers must have a sound personality and be professionally competent (Turkoglu 1990).

Previous studies investigated the prevalence of academic dishonesty and the tendency of people to commit academic dishonesty (Yesilyaprak and Ozturk 1996; Kaymakcan 2002; Semerci 2004; Roig and Caso 2005), why is cheating wrong? (Bouville 2010), engagement in academic dishonesty (Henning et al. 2015; Huang and Yang 2015), connection between self-efficacy and academic cheating (Alt 2015). Moreover, in their study entitled "Who Cheats at University? A Self-report Study of Dishonest Academic Behaviours in a Sample of Australian University Students" Marsden et al. (2005) investigated the association of dishonest academic behaviours with student demographics, academic policy offered to the students, self-efficacy and academic orientation in a sample of 954 university students. The authors discovered that academic dishonesty is associated with low levels of learning, a desire to have higher grades, and a low sense of self-efficacy.

Academic dishonesty and self-efficacy are two complementary concepts. One of the most prevalent reasons for an individual to commit academic dishonesty is the wish to get higher grades coupled with a low sense of self-efficacy,

that is the feeling that high grades won't be achieved without cheating. Conversely, someone with a high sense of self-efficacy won't see a need to cheat.

Purpose of the Study

The purpose of this study is to investigate how accurately the prospective teachers' tendencies of academic dishonesty and senses of self-efficacy are classified according to their grades from 1st to 4th.

Significance

Academic dishonesty and self-efficacy are two complementary terms. Prospective teachers should have a high sense of self-efficacy and no tendency to academic dishonesty because students impersonate and adapt their teachers' personality traits, behaviours, and cognitive skills. Their teachers' point of view towards and reactions against cheating affect the new generation to a great extent. Therefore, this study is of significance for universities, and the education system in general, to avoid quality problems.

METHODOLOGY

Design

This study is based on correlational design. Correlational studies are the ones which investigate the association between two or more variables and examined without intervening in any way to these variables. Correlational studies are executed to assign individuals into populations with minimal error according to a categorical dependent variable (Tatlidil 1992; Cokluk et al. 2010).

Study Group

The participants consisted of 234 teachers studying in the 1st to 4th grades of the English Language Teaching department of a state university located in Marmara region in Turkey during 2012-2013 academic year.

Instruments

To measure the participants' level of academic dishonesty, the Academic Dishonesty Tendency Scale was used. The 22-item, five-point Lik-

ert-type scale with four factors was developed, validated, and tested for reliability by Eminoglu (2008). The Cronbach Alpha internal consistency coefficient for the entire scale was estimated to be 0.90, and the test-retest temporal reliability factor was estimated to be 0.88. The construct validity was tested through exploratory and confirmatory factor analysis, which yielded satisfactory results.

Participants' sense of self-efficacy was measured with the Teacher Self-efficacy Scale which was developed by Gibson and Dembo (1984) and revised by Guskey and Passaro (1994). The scale was adapted into Turkish by Diken (2005) with an internal consistency coefficient of 0.71.

Data Collection

Both scales were administered successively in a single session to measure participants' tendencies of academic dishonesty and senses of self-efficacy.

Data Analysis

The data were analysed using discriminant analysis, one of the multivariate analysis methods. Discriminant analysis was first developed as a statistical method by Ronald A. Fisher in 1936 (Albayrak 2006). Since then it has been used in many statistical studies, particularly for the purpose of classification. Discriminant analysis is used to estimate the correlation between categorical dependent variable(s) and independent metric variables (Kalayci 2010). Discriminant analysis produces functions enabling the assignment of variables in a data set into two or more groups optimally considering the p number of units (Ozdamar 2004). Discriminant analysis aims at determining one or more functions made of linear combinations of variables which maximize the differences between individuals constituting two or more groups (Cakmak 1992).

The two data sets obtained from the scales were used in the analysis. Prior to the analysis the assumptions of discriminant analysis were controlled. Next, the specific discriminant analysis method was chosen. Since the assumption of discriminant analysis regarding the equality of variance-covariance matrixes was not met, quadratic discriminant analysis method was used instead of multiple discriminant analysis. Prospective teachers' grade levels were taken as a

dependent variable whereas their scores from the Academic Dishonesty Tendency and Teacher Self-efficacy scales were taken as independent variables. The data were analysed with "SPSS (16) for Windows" software.

RESULTS

Assumptions of Discriminant Analysis

In order to avoid the possibility of improper classification, the same assumptions of ANOVA and MANOVA tests were met for the analysis. Cokluk et al. (2010) list the assumptions as follows:

1. Sample size
2. Normal distribution
3. Homogeneity of Variance-covariance matrixes
4. Outliers
5. Multicollinearity

Regarding sample size, the n number of each group (group size) does not need to be equal. However, the rule of thumb is the number of cases or units in the smallest group must be more than the number of independent (predicting) variables. The best option is having a sample size four or five times greater than the number of independent variables. For example, if there are four or five variables, the size of the smallest group should be at least 20 (Poulsen and French 2008). Since this data set contains 234 cases and only 2 independent variables, this study meets this assumption.

The descriptive statistics were analysed for data obtained from both scales to test the assumption of univariate normal distribution. The mean value (59.58), median value (60), and mode (60) of the data obtained from the Academic Dishonesty Tendency Scale were close to each other, and the same was also true for the data obtained from the Teacher Self-efficacy Scale (mean value 50.83, median value 51, mode 51). Moreover, the skewness (-0.48) and kurtosis (-0.29) statistics for the Academic Dishonesty Tendency scores, and skewness (0.03) and kurtosis (-0.33) statistics for the Teacher Self-efficacy scores, ranged between -1 and +1. These results imply that the scores regarding independent variables do not deviate excessively from the normal distribution. The multivariate normality assumption was tested with Box's M test, which yielded a significant result of 0.000. This result indicates

that the covariance matrixes of all of the groups of dependent variables are not equal. Thus, as the assumption of discriminant analysis regarding the equality of variance-covariance matrixes was not met, a quadratic discriminant analysis method was used instead of multiple discriminant analysis. If the covariance matrixes of all of the groups are equal, linear discriminant analysis is used; otherwise, quadratic discriminant analysis is used (Ozdamar 2004).

Five outlier cases (1, 2, 3, 8, and 13) were discarded after univariate normality analysis, since their standardized z scores from the Academic Dishonesty Tendency Scale exceeded +3. When multivariate normality was examined, the estimated Mahalanobis distance values were compared to the critical χ^2 value. Since there were three variables in the analysis, the χ^2 value was 12.436 for two degrees of freedom. In the χ^2 table, the critical value of χ^2 is 13.816 for 0.001 significance level and 2 (3-1) degrees of freedom. Thus, it is understood that the estimated Mahalanobis distance values are not higher than the critical value.

When the multicollinearity statistics were analysed, the *VIF* values were found to be substantially less than 10 (1.089), the *CI* values were less than 30 (1.000; 8.548; 25.546), and the tolerance values were substantially greater than 0.10 (0.918). These results indicate that there is no collinearity problem between independent variables.

Discriminant Analysis

At the results show that the mean scores from the Academic Dishonesty Tendency Scale were

50.7647, 57.4828, 55.7879, and 66.7627 for 1st to 4th grades, respectively (Table 1). The mean scores from the Teacher Self-efficacy Scale were 54.1569, 52.3448, 51.1515, 46.1186 for 1st to 4th grades, respectively. Thus in grades 2-4 the mean Academic Dishonesty Tendency scores are higher than mean Teacher Self-efficacy scores.

As it is indicated in the results two functions were produced during the analysis (Table 2). The eigenvalue for the first function is 0.544, which is acceptable; the eigenvalue for the second function is 0.011, which is not acceptable. In this analysis, the canonical correlation coefficient of the first discrimination value is 0.594, the square of which (0.352) indicates how much of the variance (%) in the dependent variable is accounted for by the discriminant function. In other words, the first discriminant function is able to classify students according to their grades with an accuracy of 35.2 percent. The canonical correlation coefficient of the second discrimination value is 0.106, the square of which is 0.011. This value suggests that the discrimination power of second function is quite low. These findings indicate that the first function is moderately effective in discriminating groups, while second function has a trivial effect.

The Wilks' Lambda values for the two functions are shown in Table 3. The Wilks' Lambda value indicates the proportion of the total variance in the discriminant scores that cannot be explained by the differences between the groups (Burns and Burns 2009). In the present study, this value was estimated to be 64 percent for the first discriminant function and 99 percent for the

Table 1: Group statistics

		$\bar{X}$	ss
1 st grade	Academic Dishonesty Tendency Scale	50.7647	11.3817
	Teacher Self-efficacy Scale	54.1569	4.4558
2 nd grade	Academic Dishonesty Tendency Scale	57.4828	13.1272
	Teacher Self-efficacy Scale	52.3448	5.0142
3 rd grade	Academic Dishonesty Tendency Scale	55.7879	14.1579
	Teacher Self-efficacy Scale	51.1515	5.5087
4 th grade	Academic Dishonesty Tendency Scale	66.7627	6.56621
	Teacher Self-efficacy Scale	46.1186	4.41816
Total	Academic Dishonesty Tendency Scale	57.8803	12.99796
	Teacher Self-efficacy Scale	50.8333	5.69033

Table 2: Eigenvalues

Function	Eigen value	Variance percentage	Cumulative percentage	Canonical correlation
1	0.544	98.0	98.0	0.594
2	0.011	2.0	100.0	0.106

second function. The χ^2 value of the Wilks' Lambda value is significant for the first function ($\chi^2 = 102.514$) but not for the second function ($\chi^2 = 2.577$) at the 0.05 significance level. Therefore, the distinction power of the first function is significantly high, that is groups can be discriminated with this function. Approximately 64 percent of the total variance in the discriminant scores cannot be explained by the differences between groups in the first function.

Table 3: Wilks' Lambda statistics

Function	Wilks' Lambda	Chi-square	df	p
1	0.640	102.514	6	0.000
2	0.989	2.577	2	0.276

All of the differences between the groups regarding the scores from the Academic Dishonesty Tendency Scale [$F_{(3,230)} = 18.150, p < .05$] and the Teacher Self-efficacy Scale [$F_{(3,230)} = 27.92, p < .05$] were found to be significant (Table 4). The Wilks' Lambda values for the Academic Dishonesty Tendency and Teacher Self-efficacy scores were 0.809 and 0.733, respectively (Table 4). Wilks' Lambda statistics near 1 indicate that the subtests are not effective in discriminating among the groups. As the Wilks' Lambda value of an independent variable decreases, the contribution of the variable to the discriminant function increases.

The independent variable with the greatest contribution to the discrimination of the groups is the score from the Teacher Self-efficacy Scale (0.763) for the first function and the score from

the Academic Dishonesty Tendency Scale (0.817) for the second function (Table 5).

Table 5: Standardized coefficients regarding the discriminant function

	Functions	
	1	2
Academic Dishonesty Tendency Scale	-0.583	0.817
Teacher Self-efficacy Scale	0.763	0.653

A structure matrix provides the correlation between discriminant functions and independent variables used in discriminant analysis. In this study, the independent variable with the highest correlation with discriminant function is the score from the Teacher Self-efficacy Scale (0.814) for the first function and the score from the Academic Dishonesty Tendency Scale (0.760) for the second function (Table 6). Standardized coefficients regarding the discriminant function and structural matrices coefficients yielded similar results.

Table 6: Structure matrices coefficients

	Functions	
	1	2
Teacher Self-efficacy Scale	0.814	0.581
Academic Dishonesty Tendency Scale	-0.650	0.760

Classification results show that 29 out of 51 (56.9%) first grade students, 14 out of 58 (24.1%) second grade students, 16 out of 66 (24.2%) third grade students, and 54 out of 59 (91.5%) fourth grade students were classified correctly (Table 7). In total, 48.3 percent of the 234 students were classified correctly according to their grades.

Table 4: Wilks' Lambda equality of group means test

	Wilks' Lambda	f	df1	df2	p
Academic Dishonesty Tendency Scale	0.809	18.150	3	230	0.000
Teacher Self-efficacy Scale	0.733	27.919	3	230	0.000

Table 7: Classification results

Grade	1 st grade		2 nd grade		3 rd grade		4 th grade		Total	
	f	%	f	%	f	%	f	%	f	%
1 st grade	29	56.9	9	17.6	9	17.6	4	7.8	51	100
2 nd grade	17	29.3	14	24.1	10	17.2	17	29.3	58	100
3 rd grade	23	34.8	10	15.2	16	24.2	17	25.8	66	100
5 th grade	4	6.8	0	0.0	1	1.7	54	91.5	59	100

Total percentage of correct classification = 48.3%

DISCUSSION

In this study, the researcher investigated how correctly the tendencies of academic dishonesty and senses of self-efficacy of 234 voluntary prospective English language teachers' were classified according to their grade levels. The academic dishonesty tendency mean scores in 2nd, 3rd and 4th grades were higher than the teacher self-efficacy mean scores in those grades. In addition, the teacher self-efficacy mean scores decreased with increasing grade level. These findings are consistent with the results of previous studies (Evans and Craig 1990; Murdock et al. 2001; Finn and Frone 2004; Marsden et al. 2005). In contrast, the tendency to academic dishonesty does not vary by grade level (Eminoglu-Kucuktepe 2011). Evans and Craig (1990) and Murdock et al. (2001) reported that cheating in school is strongly associated with having a lower sense of academic self-efficacy. Marsden et al. (2005) indicated that academic dishonesty is associated with a lower level of learning, a desire to have higher grades, and a low sense of self-efficacy. Finn and Frone (2004) found that identification with school and academic self-efficacy were significantly and negatively related to cheating. That is, cheating was higher for students with lower senses of self-efficacy and lower levels of school identification. Alt (2015) showed a positive connection between constructivist practices in the learning setting and an increased sense of self-efficacy, which in turn reduced the tendency toward academic cheating.

The researchers found that the first function was moderately effective in discriminating among groups, whereas the second function was not effective. Accordingly, 54 out of 59 (91.5%) of 4th grade students and 113 out of 234 (48.3%) total students were classified correctly.

CONCLUSION

Academic dishonesty and self-efficacy are two important terms in education. Teachers have effective roles in school. Teachers and prospective teachers must be honest and should have high senses of self-efficacy in order to educate new generations well. Academic dishonesty has been a problem for many decades and has been increasing in prevalence from year to year. In addition, students think academic dishonesty is a normal behaviour.

RECOMMENDATIONS

The most important limitation of this study is that it was conducted in an English Language Teaching department in the education faculty. This study should have been done in the other teaching departments and other faculties. This study reveals that academic dishonesty behaviour is a serious problem and we have to take some precautions. For instance, when entering the university, students can sign an honour agreement. In addition, lecturers can use software which detects plagiarism in take-home work. We have to teach "honesty" in every lesson, not only in moral lessons. Lecturers in the university and teachers in the schools should use exams that include differently-formatted questions and should not use the same exams every year.

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