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Relationship Between Student Characteristics and Academic Achievement in Distance Education and Application on Students of Anadolu University

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INTRODUCTION

General interest in distance education, which is perceived as a practical choice by many students, and education institutions is increasing more and more in parallel with the advances in the information and communication technologies. High motivation level, maturity, and self-discipline are seen as necessary general characteristics of successful students for the achievement of distance education programs and for the continuity of students to the programs (Willis, 1994). A combination of cognitive style, personality characteristics and self-expectations is asserted to be able to predict the achievement in distance education (McIsaac & Gunawerdena, 1996). By this study, it is aimed to determine the self-efficacy beliefs for distance education, achievement goals, and self-regulation abilities of students, which are some of the characteristics motivating students of distance education, and to suggest a relationship between these characteristics and academic success.

STUDIES ON STUDENTS CHARACTERISTICS IN DISTANCE EDUCATION: A BRIEF

There has been many works performed on student characteristics of distance education. In some of these Oxford, Re., Park-Oh, Y., Ito, S., & Sumrall, M., in the Japanese language program published through satellite television, it has been shown that student characteristics like motivation, learning styles, gender, and, learning strategies played a very important role in academic achievement (1993). Chan M. S. C, Yum, J. , Fan, R. Y. K., Jegede, O. & Taplin, M. have compared high achieving and low achieving open university students according to their study habits, purpose for learning, approaches to study, use of support systems, other commitments and self-perceptions and have shown that motivation is a factor effecting achievement (1999). Roblyer (1999)'s study demonstrated on factors that motivate community college and virtual high school students to choose online or traditional course formats. Findings of this study indicate that for students who chose distance learning, control over Face and timing of learning was more important; for students who chose face-to-face (FTF) course, interaction with instructor and students was paramount. Lee (2002), examined gender differences in motivational and behavioral learning strategies in the Internet-based cyber-learning environment and found highly significant gender differences in the category of textual encoding strategies, in which males showed stronger behavioral and motivational learning strategies.

As well as these student characteristics mentioned above, self-efficacy studies are also very popular for distance education. Some of these can be summed up as such: Joo, Bong & Choi (2000), examined effect of student motivation on performance in Web-based instruction (WBI) and found that student's self-efficacy for self-regulated learning positively related to his/her academic self-efficacy, strategy use, and Internet self-efficacy. In a work aiming to form a model that can predict the satisfaction of Web based adult distant learners and their intention to join again in the distance education courses to be presented through Web in the future, Lim (2001) has indicated that, self efficacy in computer knowledge was the only statistically significant variable that can help predict the achievement. Wang and Newlin (2002)'s study investigated college student's personal choice for taking web-based courses and whether their self-efficacy for the course content

and technological components would predict their performance in on-line sections of a class. They have found that measures of self-efficacy were predictive of final exam scores, but demographic factors (age, gender, the number of hours employed per week, the number of children living at home, and distance traveled to campus) do not correlate with final grades in an on-line class.

The present investigation examined relationship among several motivational characteristics (like self-efficacy for distance education, self-regulation and achievement goals) and academic achievement in distance education settings.

RELATIONSHIP AMONG SELF-EFFICACY AND SELF REGULATION AND ACHIEVEMENT GOALS

Self-efficacy refers to an individual's expectancy in his or her capability to organize and execute the behaviors needed to successfully complete a task (Bandura, 1977; Schunk, 1991). Self-efficacy beliefs can determine how people feel, think, motivate themselves, and act. Bandura points out that, in the basis of self-efficacy there lies a mechanism of changing, continuing and generalizing of behavior (Bandura, 1977).

Self-efficacy beliefs effect behaviors through important means. Self-efficacy beliefs effect choices of persons about whether will they be in similar occupational activities in the future or not (Turner & Shallert, 2001). These beliefs, do not only effect the choice of activities, but also help persons in determining how much will they strive for achievement, how long will they exert themselves against difficulties, and how will they handle troubles and maintain their course (Bandura, 1977; Pajares, 2002).

In the case of education, self-efficacy is seen to be related with effort, persistence and achievement. Chemers, Hu & Garcia (2001), in their work on mathematical problem solving, have shown that children with higher self-efficacy strived for longer periods and used more effective problem solving strategies than students with lower self-efficacy.

Researches show that self-efficacy beliefs have positive effects on student motivation and achievement (Pintrich & De Groot, 1990; Zimmerman, Bandura & Martinez-Pons, 1992; Pajares & Miller, 1994). For example, Pintrich & De Groot (1990), reported that academic self-efficacy positively correlated to various outcome measures such as grades seatwork performances, scores on exams and seat work performances, scores on exams and quizzes, and quality of essay and reports. Researchers have established that self-efficacy is a strong predictor of academic performance. Multon, Brown, & Lent (1991) (cited in Chemers et al, 2001) found that self-efficacy was related both to academic performance (r=.38) and to persistence (r=.34). In the same context, Pajares & Kranzler's (1995) study has demonstrated that the direct effect of mathematics self-efficacy on mathematics performance (B=.349) was as strong as was the effect of general mental ability (B=.324).

Schunk (1991) stated that individuals who have a high sense of self-efficacy for accomplishing a task work harder and persist longer when they encounter difficulties, whereas those who do not feel efficacious may quit or avoid a task. Bandura (1994) stated that self-efficacy beliefs play a key role in the self-regulation of motivation. According to Bandura, people motivate themselves and they form beliefs about what they can do, they set goals for themselves and plan courses of action designed to realize valued futures.

Researchers in academic domain, have studied the relationship among self-efficacy and other motivational constructs such as self-regulation (Pintrich & De Groot, 1990); Zimmerman & Martinez-Pons, 1990) and goal orientation (Middleton & Midgley, 1997; Pajares, Britner & Valiante, 2000). In academic contexts, self-regulation refers to

processes that involve the activation and maintenance of cognitions, behaviors and affects which are systematically oriented toward the attainment of goals (Zimmerman, 1989; Schunk, 1989). According to Butler & Winne (1995) self-regulation is a learning style for students comprising of strong abilities like setting goals for developing knowledge, and choosing balancing strategies against unwanted situations by determining goals. And self-regulated students are aware of their knowledge, their beliefs, motivation, and qualities of their cognitive processes. Kovach (2000) stated that self-regulated learners set academic goals, select appropriate learning strategies to achieve these goals, and continually monitor goal progress. Self-efficacy is related to self-regulated learning variables. Findings in this area suggest that students with stronger self-efficacy make better use of cognitive strategies and self-regulatory practices and persist longer than those who do not.

In this area, Pintrich & De Groot (1990) suggested that academic self-efficacy beliefs were positively related to intrinsic value and cognitive and self-regulatory strategy use. Zimmerman & Martinez-Pons (1990) reported that, there is a positive relation between self-efficacy and self-regulation strategies.

Goals too are seen as an important cognitive process effecting student motivation. Goals enhance self-regulation due to their effects on motivation, learning, self-efficacy and evaluation of the process (Bandura, 1997; Schunk, 1995). In this study, achievement goals refer to the reasons that students have for doing their academic work. Achievement of goals has two general types: mastery and performance. Task goals (sometimes called learning or mastery goals), are aiming of a person for improving his/her efficacy for attaining the new knowledge and ability. And performance goals (also called ego goals) are aiming of a person for a better efficacy performance than others. In this study, mastery goals (or learning goals) are preferred. As distance-learning students do not have any means for comparing their performances with others, using performance goals was not found appropriate. Barron & Harackiewicz (2001) stated that, students following learning goals work hard against difficulties for longer than the students following performance goals, pay more attention to studying strategies, and develop a more positive manner against learning. A review of the literature on achievement goals has shown that task goals are positively related to self-efficacy and self-regulation. For example, Middleton and Midgley (1997) reported that task goals were positively related with mathematics self-efficacy and with self-regulated learning. In a similar manner, Pajares, Britner, & Valiante (2000) suggested that task goals were positively related to self-efficacy, self-concept, and self-efficacy for self-regulation.

Consequently, since learning is more personal and responsibility is more on the shoulders of the students in distance education in comparison to traditional education, motivational constructs are more important also. Distance education requires students to monitor and regulate their own learning. In order to achieve, students should have self-efficacy beliefs, determine achievement goals, control their own learning, and regulate themselves. For this reason, determining this type of characteristics of distance education students is extremely important for distance education institutions in order to give students the support and counseling they need. The present research examined the relationship between academic achievements and student's characteristics like demographic properties (age, gender, employed/unemployed), self-efficacy beliefs of distance education, and self-regulation and achievement goals for distance education.

METHOD

Participants and Procedures

Participants were 124 freshmen students who enrolled in Anadolu University's distance learning programs, including such undergraduate programs as economy, finance, public administration, working economy, industrial relations and business administration. These students were at the same time attending to academic counseling courses administered in province of Eskisehir. Because of the variations in the number of students attending academic counseling courses, student samples are selected randomly within a time frame.

50 % of the students were female and 50 % were male. They had an average of 20, ranging from 17 to 40 years old. Number of students working full-time was one fifth of students who do not work. The questionnaire was administered at the end of the semester in 2002.

Measures

The Questionnaire. The questionnaire was designed based on relevant researches. Primarily, questions on students' demographic characteristics (e.g. age, gender, employed/unemployed) were asked. Gender was coded as 1 (male) and 2 (female). In the same manner, student who does not work was coded as 1 and working student was coded as 2. The questionnaire was organized into three categories; student's self-efficacy beliefs of distance education (8 items), self-regulation skills (10 items) and achievement goals (8 items). Each item was designed with 5-point Likert scales, using values of 1 for "strongly disagree" and 5 for "strongly agree".

The Self-efficacy subscale and self-regulated learning strategies subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) were used. All items used by Pintrich & De Groot (1990) were adopted. "I'm certain I can understand the ideas taught in this course" item contained in MSLQ was adapted as "I'm certain I can understand the subjects presented in the books of distance education"; similarly the item "I'm sure I can do an excellent job on the problems and tasks assigned for this class" was adapted as "I'm sure I can do an excellent job on the problems asked at the end of chapters of distance education text books" and finally the item "I think I will receive a good grade in this class" as "I'm sure I will receive good grades from tests." Items on the MSLQ which prompt explicit social comparison (e.g., "Compared with other students in this class I think I know a great deal about the subject") were deleted or rephrased. Because, students of distance education do not have any means of comparing themselves with other students. Other questionnaire items were as follows: "I am sure I can learn in distance education at least as better as in traditional education", "I am sure I can learn at any time and any place by method of distant learning."

The self-regulation subscale of the MSLQ was used and adopted. Sample items for self-regulation were: "I ask myself questions to make sure I know the material of distance education I have been studying," "I work on practice exercises and answer end of chapter questions even when I don't have to," and "I work very hard to receive good grades even though I don't like a certain lesson of distance education program."

For the achievement goal subscale, 5 items of mastery goal orientation subscale of Patterns of Adaptive Learning Scales (PALS) (Midgley et all.,2000) were rephrased for distance education. For example "It's important to me that I learn a lot of new concepts this year" item was adapted as "It's important to me that I learn a lot of new concepts in distance education lessons this year"; similarly, "It's important to me that I thoroughly understand my class work" item as "It's my fundamental purpose that I thoroughly understand my distance education books"; and "One of my goals in class is to learn as much as I can" item as "One of my goals this year is to learn as much as I can."

Two experts in related fields of educational psychology and educational technology were consulted to verify the validity of translated and adopted items. After receiving the expert opinions, necessary arrangements were made on the items of the questionnaire and the comprehensibility of it was tested by applying on students carrying the characteristics of the sampling. In order to test the reliability of the questionnaire, it was applied two times with two weeks intervals to 10 persons who are outside the sample group but who have the characteristics of it and the Pearson correlation coefficient between the two applications was found to be $r=0.82$ ($P=0.015< 0.05$).

Academic achievement measures. At the end of the 2001-2002-education year during when the questionnaire was administered, achievement grades for all the lessons received by all the students who filled in the questionnaire were obtained. Achieved grades were summed and the total obtained was divided into the number of lessons received by the student. Thus, for each of the students who filled the questionnaire, an academic achievement grade was obtained for that educational year.

RESULTS

Preliminary Analyses

Table 1 presents descriptive statistics of scales and academic achievement. As Table 1 Shows, mean of student's academic achievement was M=50.15; self-efficacy beliefs for distance education M=28.43; self-regulation M=38.20; achievement goals M=33.53.

Table 1. Descriptive Statistics of Scales and Academic Achievement

	M	N	SD
Academic achievement	50.15	124	9.86
Self-efficacy for distance education	28.43	124	4.83
Self-regulation	38.20	124	5.90
Achievement goals	33.53	124	5.40

Correlation Analyses

A Pearson correlation was computed to examine relations among variables. At first, correlations between age (among demographic characteristics of students), self-efficacy beliefs for distance education, self-regulation and achievement goals (among motivating characteristics) and academic achievement of students were examined.

Table 2 . Pearson Correlation Coefficients Between Student's Characteristics and Academic Achievement

	Academic Achievement
Age	0.16
Self-efficacy for distance education	0.24**
Self-regulation	016
Achievement goals	0.01
* r significant at the P < .05 level of significance.	
**r significant at the P < .01 level of significance.	

The results are presented in Table 2. According to the findings, the self-efficacy of distance education was found to be significantly correlated to student's academic achievement (r=.249, p < .01). But a significant relation was not found between academic achievement and other variables (age, self-regulation, and achievement goals).

However, other variables of demographic characteristics except age; self-efficacy for distance education, self-regulation, and achievement goals were significantly correlated among themselves. Age and such variables like self-efficacy for distance education, self-regulation, and achievement goals were not significantly correlated. Whereas self-efficacy for distance education showed a significant correlation with self-regulation (r=.470, p < .01) and with achievement goals (r=.477, p < .01). Similarly, self-regulation also correlated highly with achievement goals (r=.632, p < .01).

In addition to these, Z tests were conducted in order to determine that gender variable from demographic characteristics and employed/unemployed statuses of students display a difference across academic achievement, self-efficacy for distance education, self-regulation and achievement goals.

Table 3. Z Ratios According to Gender

Variable	Z	P
Academic achievement	-1.250	.21
Self-efficacy for distance education	.333	.73
Self-regulation	2.225	.02*
Achievement goals	1.031	.30
* p < 0.05		

As it is shown also by Table 3, a significant difference was detected only on self-regulation, Z=2.225, p < .05 (s=37.04 for males and 39.37 for females) favoring females. Other variables academic achievement, self-efficacy for distance education and achievement goals did not show a significant difference across genders.

Similarly, results of Z tests conducted for determining an existence of difference displayed by employed/unemployed students across the same variables, can be seen at Table 4. According to these results, employed/unemployed students do not display a statistically significant difference in academic achievement, self-efficacy for distance education, self-regulation and achievement goals.

Table 4. Z Ratios According to Working Status

Variable	Z	P
Academic achievement	-.886	.37
Self-efficacy for distance education	-1.018	.31
Self-regulation	-.253	.80
Achievement goals	-.732	.46

Finally, regression analysis was performed to clarify the influence of the student's motivational characteristics including self-efficacy of distance education, self-regulation and achievement goals on academic achievement. As Table 5 shows, significant effect was observed for self-efficacy of distance education (p < .01). The results indicated that, self-efficacy of distance education significantly and positively predicted student's academic achievement.

Table 5. Regression Analysis of the Motivational Characteristics on Academic Achievement

	Standardized Beta	t	Sig.
Self-efficacy of distance education	.249	2.835	.005*
Self-regulation	.168	1.880	.062
Achievement goals	.014	.160	.873
* p < .01			

DISCUSSION

Motivational characteristics are very important in the literature of distance education. Because for the achieving students, researchers agree on the necessity of being motivated (Sewart, Keegan, & Holmberg, 1983). Especially in the studies carried out on motivation in distance education, it is often stated that motivation has a great importance in student achievement and continuity (Murphy, 1989; Suciati, 1990; Oxford et al., 1993; Chan et al., 1999). By this work, it is aimed to determine the relationships between academic achievement, demographic characteristics of students in distance education (like age, gender, employed/unemployed), and motivational characteristics (like self-efficacy beliefs for distance education, self-regulation, and achievement goals).

Within the present study, demographic characteristics like age, gender, and employed/unemployed were not significantly correlated with academic achievement. The results from Wang & Newlin (2002)'s study, also demonstrate that demographic factors (like age, gender, the number of hours employed per week) do not correlate with final grades in an on-line class. There was truly a significant and positive correlation between academic achievement and self-efficacy beliefs of distance education which is one of the variables motivating students. Student's self-efficacy beliefs have strong and positive influence on their academic achievement. According to the results of this study, it appears that the students with higher self-efficacy beliefs of distance education have higher academic achievement. Previous research documented significant relationship between self-efficacy and achievement (e.g., Pintrich & De Groot, 1990; Chemers, Hu, & Garcia, 2001; Joo et al., 2000).

The present investigation, did not find a significant relationship between self-regulation and academic achievement. This finding contradicts with the previous research results (Zimmerman & Martinez-Pons, 1990; Pintrich & De Groot, 1990). It can be said that students who answered the items of the questionnaire in this investigation could not have formed the strategies that serve their learning in distance education by self regulation and for this reason their academic achievement have not been in a sufficient level (M=50.15 out of hundred). Hence, there should be arrangements in distance education system that enhances self-regulated learning skills of students.

Schunk (1991) stated that, goals of persons do at the same time develop self-efficacy beliefs. In the present study, a significant relationship between self-efficacy beliefs and achievement goals were shown. Similar to the previous works (Pintrich & De Groot, 1990), a significant relationship between self-efficacy and self-regulation was also seen.

When the obtained findings were assessed against gender, male and female students do not display any difference in academic achievement, self-efficacy for distance education, and achievement goals. However, as it was found in some of the previous researchs (Zimmerman & Martinez-Pons, 1990; Joo et al., 2000), self-regulation characteristic becomes significant for females. Females reported more record than males in use of self-regulated strategies. In the current study, employed/unemployed students as demographic characteristics did not display a significant difference in academic achievement and other motivational characteristics (self-efficacy for distance education, self-regulation, and achievement goals). According to regression analysis of the motivational characteristics, self-efficacy of distance education significantly and positively predicted student's academic achievement. This result is similar to the previous works (Joo et al., 2000). With its primary emphasis on student characteristics in distance education, the current study involved only a limited number of variables presumed to influence distance learning. Future works on a larger student sampling from various regions can be restructured in a similar manner by adding different demographic characteristics like socio-economic structure and culture. Additionally, by extending this study to longer time span, self-efficacy beliefs of the students at the beginning and end of the program can be compared with themselves and with academic achievements of students.

Finally, the present study indicates that academic advisors, teachers, and instructional designers of distance education can make use of self-efficacy beliefs of students. Especially academic advisors may find out about self-efficacy beliefs of students by way of questionnaires applicable through Internet and may help motivating these students and increasing their academic achievement by means of feedback they receive from them.

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