Effect of Cognitive Entry Behaviors and Affective Entry Characteristics on Learning Level

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Abstract

In this study, the effect of cognitive entry behaviors and affective entry characteristics on learning level was investigated. The study was conducted on 258 first year students attending the Faculty of Education in the autumn semester of the 2011-2012 academic year. The study was conducted using the relational survey model and data was collected using the ¨Cognitive Entry Behaviors Test,¨ ¨Scale of Interest for the Course on Introduction to Education,¨ ¨Scale of Attitude for the Course on Introduction to Education,¨ ¨Academic Self-Efficacy Scale,¨ and ¨Achievement Test.¨ It was concluded in the study that in a university-level course the variable of cognitive entry behaviors had a significant and medium-level effect on learning level in a university level course not exhibiting a strict sequential relationship, whereas the variable of affective entry characteristics did not have a significant effect on learning level. The two variables together accounted for 6% of the variability on learning level.

Keywords

Academic Self-concept, Affective Entry Characteristics, Attitude, Cognitive Entry Behaviors, Interest, Mastery Learning, Path Analysis.

Cognitive entry behaviors are a form of pre-learning that is required in order to learn a specific learning unit (Bloom 1998; Senemoğlu, 2009). Many studies investigating the effect of pre-learning have been conducted (Alcı, Erden, & Baykal, 2010; Dochy, De Ridjt, & Dyck, 2002; Hailikari, Nevgi, & Kamulainen, 2008; Hailikari, Nevgi, & Lindblom-Ylänne, 2007; Thompson & Zamboanga, 2004). When these studies are examined, it is seen that pre-learning is a key variable regarding the level of learning. Pre-learning was reported to have had a positive and facilitating effect on learning level in 95% of studies (Dochy, Segers, & Buehl, 1999). On the other hand, although it was proven that cognitive entry behaviors, in other words pre-learning, raise learning level at primary and secondary education

level, the effect of this variable on learning level at university level courses showing a low sequential relationship is controversial (Senemoğlu, 1989). Therefore, to determine the effect of cognitive entry behaviors, one needs further studies into university level courses that specifically demonstrate low sequential relationship.

Another student quality in the mastery learning model involves affective entry characteristics. During the learning process, students who have positive affective entry characteristics tend to be more attentive, more insistent and more successful (Anderson & Bourke, 2013). Affective entry behaviors are a combination of a student's interest in, attitude towards and academic self-concept regarding a course or the learning units of that

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course (Bloom, 1998). Thurstone defined attitude as the total of an individual's tendencies, emotions, prejudices, partialities, preconceptions, ideas, fears and solid and healthy beliefs concerning a specific topic (Robinson, 1975). It is widely accepted beliefs that student' attitudes towards school and courses affect their success at school and in courses (Abu-Hilal, 2000; Robinson, 1975). Various studies were conducted to account for the effect of attitude on achievement (Abu-Hilal, 2000; Bloom, 1998; Fakeye, 2010; Freedman, 1997; Graham, Berninger, & Fan, 2007; İnal, Evin & Saracaloğlu, 2005; Ma & Xu, 2004; Nasr & Soltani, 2011; Papanastasiou & Zembylas, 2004; Rennie & Punch, 1991; Robinson, 1975; Shih & Gamon, 2001; Weinburgh, 1995; Yücel & Koç, 2011). However, different results were obtained in these studies. Robinson (1975) stated that there was not a linear relationship between attitude and achievement and this drew the attention of researchers to the possibility that there might not always be a correlation between two. In effect, it can be said that the impact of attitude on achievement may vary depending on educational stages and courses and that this is a possibility subject to further research.

Another of the components constituting the affective entry characteristics is that of academic self-concept. Academic self-concept indicates individuals' efficacy perceptions regarding their academic achievements (Wigfield & Karpathian, 1991). Another concept related to this that indicates efficacy perception and exhibits a similar nature is academic self-efficacy. Academic self-efficacy concerns individuals' solid and sincere beliefs about whether they will be able to fulfill a given academic task successfully at a predetermined level or not (Schunk, 1991). Academic self-concept is the efficacy perception in an academic field whereas academic self-efficacy is efficacy perception about the task in terms of fulfilling that specific task successfully (Bong & Skaalvik, 2003). According to Pajares (1996), both concepts measure a similar structure, namely the efficacy perception, and can therefore, be used interchangeably. According to Ferla, Valcke, and Cai (2009), students' academic self-concepts strongly influence their beliefs regarding their academic self-efficacy, and Pajares and Schunk (2001), claim that many researchers have used the two concepts interchangeably.

Bloom (1998), states that academic self-concept can account for up to 25% of variability in learning level. However, it has also been reported that studies in the relevant field dealing with the

relationship between academic self-concept and academic achievement are inconsistent (Huang, 2011; Muijs, 1997). The examination of several of these studies (Ahmed & Bruinsma, 2006; Marsh, Byrne, & Yeung, 1999; Othman & Leng, 2011; Papanastasiou & Zembylas, 2004; Saracaloğlu & Varol, 2007; Yahaya & Ramli, 2009; Yahaya, Ramli, Boon, Ghaffar, & Zakariya, 2009; Yıldız, 2010), has resulted in different conclusions, the relationship between academic self-concept and achievement varies depending on the models that deal with this relationship (Green, Nelson, Martin, & Marsh, 2006; Guay, Ratelle, Roy, & Litalien, 2010; Huang, 2011; Marsh & Yeung, 1998; Muijs, 1997).

Purpose

The purpose of this study is to determine the effect of cognitive entry behaviors and affective entry characteristics on the level of learning. The sub-goals of the study have been identified as follows: How much of the variability in learning level do cognitive entry behaviors and affective entry characteristics together account for in a university level course with a low sequential relationship?

Method

This study was conducted in the relational survey model. The explanatory and predictive relationships between learning level, cognitive entry behaviors and affective entry characteristics were investigated through a path analysis in the study. Also known as the causal model, path analysis is an analysis that aims to investigate the relationship networks among the observed variables (Bayram, 2010).

Study Group

The study was conducted on 258 first year students attending different departments at Necmettin Erbakan University Ahmet Keleşoğlu Education Faculty. A sample volume of more than 200 participants is defined as a large sample volume for structural equation models (Kline, 1998). Of the total number of participants, 22.9% of the study group consisted of males (59 people), and 77.1% females (199 people), whereas 14% (36 people) of the study group consisted of students attending the department of psychological counseling and guidance, 28.3% (73 people) the department of German, and 57.8% (149 people) the department of religious culture and morality.

Data Collection Tools

Cognitive Entry Characteristics Test: A test was developed to measure students' cognitive entry behaviors in the first three units of the course entitled "An introduction to education. The Test consisted of 15 questions, and the KR-20 value of the test was calculated to be .81.

Scale of Interest for the Course: A scale developed by the researcher was used to measure students' interest in the course "an introduction to education." In forming an items pool for the study, behavioral definitions by Özçelik (1998) indicating individual' interest in a course or a subject were taken into consideration. For construct validity of the scale, exploratory and confirmatory factor analyses were used and Cronbach's Alpha reliability analysis was conducted to test validity. Prior to the application of the exploratory factor, data was tested for its suitability of factor analysis using the Kaiser-Meyer-Olkin (KMO) and Bartlett test. At the end of the analysis, the KMO value was determined to be .80, where the minimum recommended KMO value for conducting a factor analysis on data is .60 (Pullant, 2001). When the results of the Bartlett test were examined, it was seen that the chi-square value was significant. (X^2=407.072; df=10; $p≤.01$). The results of the exploratory factor analysis also revealed, a single-factor construct accounting for 56.88 % of the total variance. The scale consisted of 5 items. A confirmatory factor analysis was conducted in order to evaluate the validity of the single-factor construct that emerged as a result of the exploratory factor analysis. At the end of the analysis, it was seen that the model had good fit values (indices) (X^2=4,670; df=4; p=,323; X^2/df=1,167; SRMR=,011; CFI=,998; GFI=,993; AGFI=,972; NFI=,993; RMSEA=,026). Good fit values for the models used are: X^2/sd, $0≤ X^2/df ≤2$; CFI $0,97≤CFI≤1,00$; GFI $0,95≤GFI≤1,00$; AGFI $0,90≤AGFI≤1,00$; NFI $0,95≤NFI≤1,00$; RMSEA $0≤RMSEA≤0,05$. For the SRMR value, values below 0,05 indicate good fit (Bayram, 2010). The Cronbach's Alpha internal consistency coefficient for the scale was calculated to be .81.

Scale of Attitude for toward Course on Introduction to Education: The Scale of Attitude for the course on "introduction to education," which was developed by Önen and Koçak (2011), was used to measure attitude. The scale consisted of 29 items and three factors, and in a study conducted on 413 education faculty students, Önen and Koçak (2011) calculated the Cronbach's Alpha reliability coefficients for the factors of the scale and for the

whole scale to be .94, .93, .77 and .95, respectively. The Cronbach's Alpha reliability analysis was conducted again for this specific study and the internal consistency coefficients for the factors and the whole were calculated to be .93, 90, .94 and .96, respectively.

Academic Self-efficacy Scale: In the study, the Academic Self-efficacy Scale, which was developed by Jerusalem and Schwarzer (1981) and adapted to Turkish by Yılmaz, Gürçay, and Ekici (2007), was used. As in the original the scale adapted into Turkish was uni-dimensional and consisted of a total of 7 items. Yılmaz et al. (2007) found the Cronbach's Alpha internal consistency coefficient to be .79. The Cronbach's Alpha reliability analysis was again conducted for this study and the internal consistency coefficient was calculated to be.71.

Achievement Test: An achievement test was developed by the researcher in order to determine students' learning level. The achievement test consisted of a total of 23 questions. A KR-20 value was calculated for the reliability of the test and this value was found to be .85.

Data Analysis

A confirmatory modeling strategy was used in this study. This makes it possible to test whether or not a very clearly identified model is confirmed by the data or not can be tested (Şimşek, 2007). The purpose of this study is not to propose a model but to test relationships based on theoretical grounding. To this end, first, a theoretical model was presented (Sütütemiz, 2005), and the effects of the variables on learning level was then tested using the path analysis. Analyses were made using AMOS 16.0 software.

Results

Correlation values for interest and attitude, attitude and self-concept and interest and self-concept were calculated at .62 and .22 respectively. The standardized regression coefficient was -.01 between interest and learning level, was .03 between attitude and learning level and self-concept and learning level, and .23 between cognitive entry behaviors and learning level. According to the R^2 value in the model, total variance accounted for in the learning level was 6%. When the results of the t-test regarding the significance of the regression coefficients were examined, it was observed that only cognitive entry behaviors had a significant

and medium-level effect on learning level. Interest, attitude and self-concept (affective entry characteristics) did not have a significant effect. In the study, fit indices (values) for the tested model were found to be X^2=1,650, p=,648, X^2/df=,550, GFI=,997, CFI=1,000 and RMSEA= ,000. These results, show that the model has good fit indices.

Discussion

Studies conducted at different educational levels and in different fields in the relevant literature point out that the variable of cognitive entry behaviors significantly explains the variability on learning level (Alcı et al., 2010; Bloom, 1998; Senemoğlu, 1989; Thompson & Zamboanga, 2004; Yanpar, 1998; Yunt, 1978). When the entry qualities were compared in this study, it was seen that only the variable of cognitive entry behaviors had a significant effect on accounting for the learning level. This is supported by studies conducted by Yunt (1978) and Yanpar (1998). According to Yunt (1978), entry variables, of a cognitive nature have a stronger effect on learning level than those of an affective nature. In his study, Yunt (1978) kept achievement motivation (an affective entry characteristic) constant and concluded that the learning levels of students with high cognitive entry behaviors were higher than those of the other students. On the other hand, when the effect of cognitive entry behaviors was kept constant, there was no evidence to indicating that the learning levels of students with high achievement motivation were higher than that of other students. In other words, Yunt (1978) concluded that when the effect of cognitive entry behaviors was kept constant, achievement motivation did not have a significant effect on learning level. Yanpar (1998), on the other hand, found that the strongest predictor of achievement level in the social sciences course was the variable of cognitive entry behaviors.

According to Bloom (1998), the variable of cognitive entry behaviors accounts for 50% of the variability in learning level. In other words, cognitive entry behaviors were highly influential on learning level. The fact that this effect was not at the expected level in this study can be explained by the fact that the study was conducted at a university level course that was not highly sequential, and because the effect of cognitive entry behaviors might vary depending on the course and whether or not the course under examination exhibits a strong sequential nature. It has been reported that at the university level, cognitive entry behaviors

are the most powerful predictors of learning level in courses based on learning subjects that have been taken previously (Senemoğlu, 1990). However, although it was proven that cognitive entry behaviors raised learning level at the primary and secondary levels, the effect of this variable on learning level at a higher educational level and in courses that have a low sequential relationship is controversial (Senemoğlu, 1989). In conclusion, the power of cognitive entry behaviors in accounting for learning level might increase at the primary and secondary education levels and in a course that has a strong sequential relationship.

According to Bloom (1998), affective entry characteristics were able to account for 25% of the variability on learning level. However, it was concluded in this study that affective entry characteristics did not have a significant effect on learning level. There might be some reasons for this result. The first of these reasons can be explained with reference to Robinson's (1975) ideas on the relationship between attitude and achievement. Robinson (1975) stated that the idea that "there is a positive relationship between students' attitudes towards school and courses and their achievement at school and in courses" is a common one but that this might not always be the case. He pointed out that experimental studies investigating the idea that attitude affects achievement and their results were not consistent. In most cases, individuals with negative attitudes could also attain a high level of achievement. According to Robinson (1975), the difficulty of measuring attitude may be one reason for the inconsistencies in the relevant literature about the relationship between attitude and achievement. A second reason may be that the power of affective characteristics in predicting achievement varies by courses.

In this study, it was found that at the university level, in a non-sequential course, cognitive entry behaviors had a significant and medium level effect on learning level, whereas affective entry characteristics did not have a significant effect. Naturally, there are a number of variables affecting learning level. For example, in earlier studies Sanderson (1976) and, White and Gettinger (1979) discovered findings indicating that the relationship between achievement and time dedicated to learning was stronger than the relationship between overall ability and achievement (as cited in Senemoğlu, 1990). In a study exploring the non-mental factors affecting university students' academic achievements, Yüksel and Sezgin (2008)

pointed out that there were significant relationships between students' perceived academic achievement levels and the extent of monthly income meeting needs, the number of individuals receiving university education in the family, studying at the desired program, and so on.

Based on the results obtained in the study, it can be suggested that further studies investigating the effect of cognitive entry behaviors and affective entry characteristics on learning level be conducted at different levels of education, in different fields and courses that do and do not have a strong sequential relationship. This is necessary to determine whether or not the effect of the variables in question vary depending on levels of education, fields of study, or whether or not the courses exhibit a strong sequential relationship. Future studies can make use of this model by identifying six different models for courses at three different levels (primary, secondary and higher education), either with or without a strong sequential relationship.

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