# The Correlation between Learning Approaches and Assessment Preferences of Eighth-Grade Students[1]

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**Abstract:** The aim of this study is to assess the correlation between the learning approaches (LA) and assessment preferences (AP) of eighth-grade students. This is a correlation research. The participants of this study are 150, eighth-grade grade students. In order to collect relevant data sub-factors of "Approaches and Study Skills Inventory for Students" and "Assessment Preference Inventory" have been used. To analyze the collected data 'canonical correlation' has been calculated. The variable sets for canonical correlation are; Set one-LA: Strategic, deep and surface learning; Set two–AP: Alternative, traditional, complex-constructivist, simple-multiple choice. The results show us that the first canonical correlation was .47 with 22 % overlapping variance; indicating significant relationships between two sets of variables.

***Key words:*** Learning approaches, assessment preferences, canonical correlation

## SUMMARY

**Purpose and significance:** In order to educate individuals who can meet the demands of today's world, students' individual differences should be taken into consideration in schools. Assessment is an important component of learning environments as are learning approaches. Recent studies have shown that students' learning approaches and assessment preferences are two important factors affecting their success. The aim of this study is to assess the correlation between the learning approaches and assessment preferences of eighth-grade students.

**Methods:** This is a correlation research which aims to find out the relation between two or more variables without any intervention. The participants of this study are 150, eighth-grade students from a private school located in Ankara, Turkey. In order to collect data, relevant sub-factors of "Approaches and Study Skills Inventory for Students" and "Assessment Preference Inventory" have been used. In order to analyze collected data 'canonical correlation' has been calculated. So, it is aimed to define the best structure which maximizes the correlation between two sets of data (Set One: Learning Approaches: Strategic, deep and surface learning; Set two: Assessment Preference: Alternative, traditional, complex-constructivist, simple-multiple choice).

**Results:** The results showed that the first canonical correlation was .47 with 22 % overlapping variance; (Wilk's Lambda = 0,755 p>, 01) indicating significant relationships between the two sets of variables. In learning approaches set "Deep Leaning Approaches" variable has strongest influence on the canonical variate of its own set. On the other hand complex-constructivist assessment variable has the strongest influence on the canonical variate of assessment preference set.

**Discussion and Conclusions:** Results showed that there is a relation between assessment preferences and learning approaches of eighth-grade students. Deep learning approach variable has the strongest influence on canonical variate of learning approaches set. On the other hand complex-constructivist assessment variable has the strongest influence on canonical variate of assessment preferences set. This means that students who use deep learning approach have a tendency to prefer complex-constructivist assessment. As a result it is evident that there is relation between learning approaches and assessment preferences of students. Modern education systems require considering individual differences of students while planning learning environment. While planning learning environment students' assessment preferences should be taken in to consideration.

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# Sekizinci Sınıf Öğrencilerinin Öğrenme Yaklaşımları ve Değerlendirme Tercihleri Arasındaki İlişki[1]

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**ÖZ:** Öğrenme yaklaşımları (ÖY) ve değerlendirme tercihleri (DT) arasındaki ilişkiyi belirlemek üzere tasarlanan çalışma korelasyonel bir araştırmadır. Veriler 8.sınıfa devam eden 150 ilköğretim öğrencisinden "Öğrenme Yaklaşımları ve Çalışma Becerileri Envanteri"ve"Değerlendirme Tercihleri Ölçeği" kullanılarak toplanmıştır. Verilerin analizinde çok sayıda değişkenden oluşan iki veri seti arasındaki ilişkileri incelemede kullanılan kanonik korelasyon katsayısı hesaplanmıştır. ÖY veri setinde stratejik, derinlemesine ve yüzeysel öğrenme yaklaşımları değişkenleri bulunurken; DT veri setinde ise alternatif ve klasik değerlendirme yöntemleri ve karmaşık-oluşturmacı, basit-seçmeli sınav türleri değişkenleri bulunmaktadır. Çözümleme sonucunda değişken dizileri arasında .47 (%22 örtüşen varyans-Wilk's Lambda 0,755 p<,01) düzeyinde orta güce sahip bir ilişki olduğu belirlenmiştir. Her değişkenin kendi veri setlerinin doğrusal bileşeninden oluşan kanonik değişkenlerdeki göreli etkilerine bakıldığında; DT veri setinde karmaşık oluşturmacı sınav türü; ÖY veri setinde ise derinlemesine öğrenme yaklaşımı değişkenlerinin yüksek kanonik yük değerlerine (.80-.90 arasında değişen) sahip olduğu belirlenmiştir. Bu bulgular, öğretim süreci biçimlendirilirken öğrencilerin öğrenme yaklaşımlarının ve değerlendirme tercihlerinin birlikte ele alınması gerektiğini vurgulamaktadır.

Anahtar sözcükler: Öğrenme yaklaşımları, değerlendirme tercihleri, kanonik korelasyon

## INTRODUCTION

Learning is permanent changes in behaviors as a result of life experiences. So, effective learning can be provided by constructing learning area effectively. In order to construct learning area effectively, students' individual differences should be taken into consideration in schools. Approaches to learning, which is one of the important individual differences that should be considered, are related with student's motivation and using their appropriate strategies for learning. According to Ellez and Sezgin (2002), motivation indicates why students want to learn and strategy indicates how they learn.

Approaches to learning refer to individual differences in the intentions a student has when facing a learning situation and the corresponding strategies by which these intentions are achieved. The conception of approaches to learning is based upon the original research of Marton and Saljo (1976), who identified individual differences in approaches to learning based on qualitative analysis of student learning. They found that "the intentions a student had prior to studying determined the learning strategies as well as the outcome of learning in terms of understanding" (Diseth, 2001). They introduced a model of qualitative differences in learning. Ramsden (2003, p.48) defined approaches to learning as intimately connected to students' perceptions of the context of learning. In that classic study Marton and Saljo showed that there are two different approaches to process the text material to be learned: "deep" and "surface" (Heikkilä and Lonka, 2006).

A student who applies a "deep approach" to learning pays attention to the fundamental idea or message of the materials to be learned. Deep approach was defined as "intention to understand, vigorous interaction with content, relate new ideas to previous knowledge, relate concepts to everyday experience, relate evidence to conclusions, examine the logic of the argument" by Byrne, Flood and Willis (2002). A student who applies a "surface approach" to learning concentrates more on the surface features of the text itself and tries to remember it word for word. If the only goal of the student is to

remember and repeat what is being written in the text, the student will not adopt the active problem-solving and thinking skills that are needed in order to deeply understand the material being read. The intention becomes to reproduce other people's ideas. According to Byrne, Flood and Willis (2002), features of surface approach are "intention to complete task requirements, memorize information needed for assessments, failure to distinguish principles from examples, treat task as an external imposition, focus on discrete elements without integration, unreflectiveness about purpose or strategies". Ünal and Ergin, (2006) compared deep and surface approaches, and found that deep learners can explain any subject clearly and obviously without any preparation whereas, surface learners can explain only apparent aspects of same subject simply.

Entwistle and Ramsden (1983), and Biggs (1987) introduced a third approach: "strategic" or "achieving" (cited in: Heikkilä and Lonka, 2006; Ramsden, 1979). Students adopting this approach work hard to get good grades. They choose their learning strategy to maximize the chances of academic success; they appear cue conscious and very aware of assessment practices (Heikkilä and Lonka, 2006). The strategic approach can take place through either deep or surface processing, in line with the demands of the context. Besides these two core concepts of approaches to learning, a kind of "mixed approach" to learning, called the strategic (or achieving) approach is often identified (Gijbels, Van de Watering, Dochy, and Van de Bossche, 2005). Learning approaches can be summarized according to their characteristics as in Table1 (Diseth, 2001).

Table1: Characteristics of Learning Approaches

| Approach | Intention | Motivation | Strategy |
|---|---|---|---|
| Deep | Understanding | Interest Vocational relevance | Operation/comprehension |
| Surface | Reproduce | Fear of failure Completion of course | Rote learning |
| Strategic | Academic success | Achievement Competition | Operation/comprehension/rote learning |

Assessment is an important component of learning environments as learning approaches. It explains quantity of students' achievement and development by measuring both learning process and products. There is a strong relationship among instruction, learning and assessment processes. Effective assessment of student achievement depends on how they are instructed and how they learn. So, all these concepts should be taken into consideration while planning the learning environment. While planning the learning environment, students' individual differences should be considered both in instruction and assessment process. For these reasons, recently, the concept of "assessment preferences" has gained importance.

The concept of "assessment preferences" refers to students' opinions, attitudes, and preferences of assessment methods and their properties. Under the concept of assessment preference some assessment methods were defined. Alternative assessment refers to assessment methods which aim to assess student behaviors in situations similar to real life settings. The focus of alternative assessment methods is on higher order thinking skills rather than lower order thinking skills. Performance tasks and portfolios are the examples of alternative assessment methods. Whereas traditional assessment refers to measurement of lower order thinking skills which is mostly focusing on memorization of in-class learning. Short answer tests, matching tests or essay tests which focus on memorization of in-class learning are the examples of traditional assessment methods. On the other hand, complex, constructivist type of test refers to essay items which require using higher order thinking skills. Simple-multiple choice assessment type refers to multiple choice and true-false exams which require lower order thinking skills and mostly memorization.

Recent studies have showed that there is correlation between learning approaches and assessment preferences of students. Students' assessment styles are changed according to learning approaches and learning strategies they preferred (Birenbaum, 1997; Entwistle, 2000; Birenbaum and Rosenau 2006;

Gijbels and Dochy, 2006; Birenbaum, 2007). Moreover, Senemoğlu, Berliner, Yıldız, Doğan, Savaş and Çelik (2007) indicate that if assessment activities require deep learning, students will prefer deep learning approach; on the other hand, if it requires surface learning they will prefer surface learning approach.

Defining the correlation between learning approaches and assessment preferences will guide teachers for constructing learning area effectively. Knowing the relationship between these individual differences will help teachers while assessing students' individual differences and shaping the learning environment depending on those individual differences. Moreover, in Turkey, there are few studies about assessment preferences and learning approaches which were carried out in high schools. Carrying out a study to assess the relationship between learning approaches and assessment preferences will provide important data for teachers and researchers.

So in this study it is aimed to find out the correlation between the learning approaches and assessment preferences of eighth-grade students. Below are the research questions of this research.

1. What is the correlation between learning approaches and assessment preferences of eighth-grade students?

2. What are the canonical factor loadings of the variables situated in learning approaches and assessment preferences data sets?

## METHOD

### Research Model and Working Group

This is a correlation research. This type of research aims to find out the relationship between two or more variables without any intervention. Correlational studies are very useful to reveal the relations between variables; also, they provide clues for researchers to make further, more complex studies (Büyüköztürk, Akgün, Özkahveci and Demirel, 2008).

New elementary school instruction program which was put in to practice in 2004-2005 academic year, requires teachers to use student centered instruction methods and alternative assessment methods. This new elementary school instruction program aims to improve and assess students' higher order thinking skills. This research requires participants who have enough experience in terms of alternative assessment methods and student centered instruction methods. Because eighth-grade students have been educated according to new instruction program for five years, they are thought to have enough experience in terms of alternative assessment methods and student centered instruction methods. So, working group of this study includes 150, eighth-grade students from a private school located in Ankara, Turkey.

### Instruments

In order to collect data, relevant sub-factors of "Approaches and Study Skills Inventory for Students (ASSIST)" and "Assessment Preference Inventory (API)" has been used.

Assessment Preference Inventory (API)

API was originally developed by Birenbaum (1997) and adopted into Turkish cultural setting by Gülbahar and Büyüköztürk (2008). API has 72 items and various subscales which aim to assess different aspects of assessment preference.

In this study, Traditional Assessment, Alternative Assessment, Simple-Multiple-choice Assessment and Complex-constructivist Assessment subscales has been used. Factor loadings of these subscales vary between .45 and .78 values. Cronbach alpha inter reliability coefficient of these factors vary between .58 and .86. Some important fit indices of API such as (/sd)=4.57, RMSEA=.08, RMR=.12, StRMR=.07, GFI=.89, AGFI=.85, can be shown as proofs that the construct validity is achieved. The Cronbach alpha values of these factors which were calculated in this study vary between .55 and .79.

The API is a 5-point Likert-type questionnaire containing items referring to three content dimensions: assessment form-related dimensions, examinee-related dimensions, and grading and recording. These dimensions were identified on the basis of a 22-facet mapping sentence describing the assessment domain, which included elements of traditional, as well as alternative assessment praxis. (For the mapping sentence, see Birenbaum, 1994). Each item was rated on a 5-point scale indicating the extent to which the student would like to be assessed in that manner, where 15 indicates "to a very small extent" and 55 "to a very large extent".

Approaches and Study Skills Inventory for Students (ASSIST)

ASSIST was originally developed by Tait, Entwistle and McCune (1998) and adopted into Turkish cultural setting by Senemoğlu et al (2007). The ASSIST is a 5-point Likert-type questionnaire containing 60 items referring to three content dimensions. ASSIST has three subscales as "Deep Learning Approach", "Surface Learning Approach and "Strategic Learning Approach". Cronbach alpha inter reliability coefficient of these factors vary between .70 and .81. Confirmatory factor analysis results show that the model explains the structure of the scale fits with the collected data. Some important fit indices of ASSIST; such as (/sd)=2.99, RMSEA=.05, RMR=.12, StRMR=.05, GFI=.86, AGFI=.84 can be shown as a proof that the construct validity is achieved.

**Data Analysis**

In order to analyze collected data canonical correlation coefficient has been calculated. Canonical correlation analysis (CCA) is a way of measuring the linear relationship between two multidimensional variables. It finds two bases, one for each variable, that are optimal with respect to correlations and, at the same time, it finds the corresponding correlations. In other words, it finds the two bases in which the correlation matrix between the variables is diagonal and the correlations on the diagonal are maximized. The dimensionality of these new bases is equal to or less than the smallest dimensionality of the two variables (Tabachnick and Fidell, 1996).

The canonical correlation is optimized such that the linear correlation between the two latent variables is maximized. The purpose of canonical correlation is to explain the relationship of the two sets of variables, not to model the individual variables. Canonical correlation finds the linear combination of variables that produces the largest correlation with the second set of variables. This linear combination or "root" is extracted and the process is repeated for the residual data, with the constraint that the second linear combination of variables must not correlate with the first one. The process is repeated until a successive linear combination is no longer significant (Tabachnick and Fidell, 1996).

In canonical correlation data sets can be defined as dependent and independent variables. In this situation, the aim of canonical correlation is to find out if the independent variable data set affects the dependent variable data set. But researchers are not obliged to separate data sets as dependent and independent variables; especially, if the researchers think that there is a two way relationship between the variables in the data sets (Kalaycı, 2008). This is why in this study data sets are not separated as dependent and independent variables.

CCA is a member of the multiple general linear hypothesis family and shares many of the assumption of multiple regression such as linearity of relationship, homoscedasticity (same level of relationship for the full range of the data), interval data, lack of multicollinarity, multivariate normality and lack of multivariate outliers.

**FINDINGS**

Canonical correlation analysis was used to examine the relationship, if any, between the learning approach and the assessment preferences of eighth-grade students. First set of variables (Learning approaches) includes "deep learning", "surface learning" and "strategic learning" approaches. On the

other hand, second set of variables (assessment preference) includes "alternative assessment", "traditional assessment", "complex-constructivist assessment" and "simple-multiple choice assessment" methods.

Before the analysis, some assumptions of canonical correlation were tested. For assessing if there is any multicollinarity problem, Pearson correlation between variables was checked. As there is no correlation above .70, it was thought that there is no multicollinarity problem. Moreover, tolerance values were examined to check multicollinarity problem (in each case tolerance values are close to 1). To test multivariate outliers, Mahalanobis distance coefficients were examined and a few multivariate outliers were removed. To test homoscedasticity Box-M statistic was examined. The F value was not found significant which means that homoscedasticity assumption is not violated. Univariate normality was checked for each variable independently and it was found univariate normality was achieved. So, it was assumed that multivariate normality was achieved. For linearity assumption scatter plots were examined.

The results of the canonical correlation analysis are presented in Table 2.

Table 2: Canonical correlations and coefficients, variance, and redundancies of assessment preferences and learning approaches

| | First canonical variate | |
|---|---|---|
| | Correlation | Coefficient |
| **Assessment preferences** | | |
| Traditional assessment | .414 | .406 |
| Alternative assessment | -.326 | .023 |
| Simple-multiple choice assessment | -.292 | .133 |
| Complex-constructivist assessment | -.899 | -.997 |
| Percent of Variance | .293 | |
| Redundancy | .066 | |
| **Learning Approaches** | | |
| Deep Learning Approaches | -.825 | -.560 |
| Strategic Learning Approaches | -.765 | -.416 |
| Surface Learning Approaches | .469 | .469 |
| Percent of Variance | .495 | |
| Redundancy | .111 | |
| **Canonical Correlation** | .474 | |

Table 2 shows that the first canonical correlation was .47 (with 22 % overlapping variance; Wilk's Lambda ($\Lambda$) =.755, p<.01) indicating significant relationships between the two sets of variables. Second and third canonical correlations were not found significant. This means that there is significant and middle strong correlation between students' assessment preferences and learning approaches.

Using a cut-off correlation (Canonical factor loadings) of .30 (Tabachnick & Fidell, 1996), Complex-constructivist assessment, (-.90) traditional assessment (.42) and alternative assessment (-.33) variables have strong influence on the first canonical variate of assessment preference set. Whereas, since canonical factor loading of "simple-multiple choice assessment" variable is less than .30, it wasn't taken in to considerations during interpretation of the findings. On the other hand, complex-constructivist assessment variable has the strongest influence on the first canonical variate of assessment preference set.

In learning approaches set "Deep Leaning Approaches" variable has the strongest influence on the canonical variate of its own set. The canonical factor loading of "Deep Leaning Approaches" variable (-.83) is respectively higher than "Strategic Learning Approaches" (-.77) and "Surface Learning Approaches" (.47) variables.

The reported percentage of variance values in Table 2 indicates that the first canonical variate pair accounts for 29% of the variance of students' assessment preference and 50% of the variance of the

students' learning approaches.  The redundancy values reveal that proportion of variance of "Assessment Preference" explained by canonical variate of "Learning Approaches" is .06. This means that canonical variate of "Learning Approach Set" explains 6% of the variance in "Assessment Preference Set" On the other hand proportion of variance of "Learning Approach Set" explained by canonical variate of "Assessment Preference Set" is .11. This means that canonical variate of "Assessment Preference Set" explains 11% of the variance in "Learning Approach Set".

## DISCUSSION AND SUGGESTION

As a result, it is obvious that there is relationship between the learning approaches and assessment preferences of students. In other words, this means that the assessment methods that the teachers use are very important tools to change students' learning approaches. So, assessment methods are very important to shape the learning of students.

In this study, deep learning approach variable has the strongest influence on canonical variate of learning approaches set. On the other hand, complex-constructivist assessment variable has the strongest influence on canonical variate of assessment preferences set. So, those variables have the strongest effect on the canonical correlation between two data sets. Briefly, it can be interpreted that teachers who use complex – constructivist assessment type, create an atmosphere for their students to apply deep learning approaches. Modern world requires people who apply deep learning approach to be successful in real life. This is why teachers should use assessment methods which aim to assess higher order thinking skills. Beşoluk and Önder (2010) indicated that deep learning approach positively correlates with critical thinking. In this respect, using assessment methods which aim to assess lower order thinking skills lead students to apply surface learning approaches. In other words, students who use deep learning approach have a tendency to prefer complex-constructivist assessment.

A study of the relationship between assessment preferences and learning approaches showed that undergraduate students adhering to deep learning approach tended to prefer open-ended items, whereas, those who adhere to surface approach tend to prefer multiple choice items (Birenbaum and Feldman, 1998). Senemoğlu, et al (2007) indicate that if assessment activities require deep learning, students will prefer deep learning approach, on the other hand, if it requires surface learning they will prefer surface learning approach. These research results correspond to the results of this study. Moreover, results show that there is also a relationship between assessment preferences and other characteristics related to learning such as learning strategies, learning modalities (Birenbaum 1997; Birenbaum and Feldman, 1998; Biggs, 2003; Doğan, 2011).

Modern education systems require considering individual differences while planning learning environment. In this process focus has always been on learning styles, approaches, strategies, etc. So far, assessment preferences of students have been ignored.  So, while planning learning environment students' assessment preferences should also be taken in to consideration.

In Turkey, a new elementary school instruction program has put in to practice in 2004 -2005 academic year. Since 2004 -2005 academic year some assessment methods, which aim to measure higher order thinking skills, have started to be used in schools. But the problem is that teachers do not have enough experience and knowledge about how to develop and use those assessment methods such as performance tasks and portfolios. As result of this, quality of those assessment applications decreased. Although teachers use some assessment methods which aim to assess higher order thinking skills, because these assessment tools are not developed and administered as they should be, they don't encourage students to apply deep learning approaches. Atmaca, Aslan and Doğan (2009) revealed that preferring assessment methods which aim to measure higher order thinking skills are not a significant predictor of applying deep learning approaches since those assessment methods are not developed and administered as they should be. So, teachers' competence in those assessment methods should be increased. Moreover, Kilmen and Demirtaşlı (2010) stated that only 22,5% of teachers use projects frequently that are used to improve and assess students' higher order thinking skills such as critical thinking and doing scientific research.

Briefly, teachers should use assessment tools that aim to assess higher order thinking skills to encourage their students to apply deep learning approaches. On the other hand, teachers need to be trained about how to use and develop those assessment methods effectively. Ministry of Education should plan effective in-service training to increase teachers' competence in those assessment methods. Moreover, in faculties of education, pre-service teachers should be trained effectively about assessment methods which aim to assess higher order thinking skills. To improve the quality of the learning, quality of assessment should be increased.

More studies should be conducted to strengthen those findings. Below are the suggestions for researchers;

- It is advised that researchers conduct similar studies in different grade levels and different school types (Current study was conducted in a private school).
- In future studies working sample should be expanded.
- API has some others sub-factors which were ignored in this study. Researchers who want to study similar topics can take those sub-factors into consideration.
- In future studies, besides learning approaches, others factors related to learning such as learning strategy, learning styles, motivation strategies etc. should also be considered as independent variables.
- In future studies, calculating some data analysis techniques such as multiple regressions, discriminant analysis, etc. may help researchers to reveal important findings which are not revealed in this study.
- In order to find out one way and two way relationships among variables, a structural equation model should be formed and confirmed.
- Moreover, a qualitative study should be conducted in order to support quantitative research findings and reveal more profound data.

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