⌈Araştırma Makalesi / Research Article⌋

Kastamonu Eğitim Dergisi
Kastamonu Education Journal
Kasım 2019 Cilt:27 Sayı:6
kefdergi.kastamonu.edu.tr

Başvuru Tarihi/Received: 19.11.2018
Kabul Tarihi/Accepted: 15.02.2019
DOI: 10.24106/kefdergi.3432

Yaşam Temelli Öğretim Yaklaşımına Dayalı 5E Modeli Kullanımının Öğretmen Adaylarının Ölçme Değerlendirme Dersine Yönelik Tutum ve Özyeterlik Algıları Üzerine Etkisinin İncelenmesi

An Investigation of the Effects of 5E Model Based on Context-Based Instruction Approach on the Attitudes and Perception of Self-Efficacy of Pre-Service Teachers towards the Assessment and Evaluation Course

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Öz

Bu araştırmanın amacı, yaşam temelli öğretim yaklaşımına dayalı 5E modelinin öğretmen adaylarının ölçme değerlendirme dersine karşı tutum ve öz yeterlik algıları üzerindeki etkisini belirlemektir. Bu amaçla ölçme-değerlendirme dersi konularına uygun bağlamlar hazırlanmış ve yaşam temelli öğretim yaklaşımına dayalı 5E modeline uygun olarak dersler işlenmiştir. Çalışma grubunu 2017-2018 Öğretim yılı, bahar yarıyılında Kilis 7 Aralık Üniversitesi fen bilgisi öğretmenliği bölümü, 3. sınıfında öğrenim gören 30 öğrenci oluşturmaktadır. Çalışmada araştırma yöntemi olarak tek grup ön test son test zayıf deneysel desen kullanılmıştır. Uygulama yaklaşık dört hafta sürmüştür. Veri toplama aracı olarak Eğitimde Ölçme ve Değerlendirme Dersine Yönelik Tutum Ölçeği ve Eğitimde Ölçme ve Değerlendirmeye Yönelik Özyeterlik Algısı Ölçeği kullanılmıştır. Elde edilen veriler bağımlı gruplar t testi ile analiz edilmiştir. Çalışmanın sonucu olarak yaşam temelli öğretim yaklaşımına dayalı 5E modelinin öğrencilerin ölçme ve değerlendirme dersine karşı tutumlarında ve özyeterlik algı ön test ve son test ortalamalarında istatiksel olarak anlamlı farklılık olduğu belirlenmiştir.

Anahtar Kelimeler: yaşam temelli öğretim yaklaşımı, 5E modeli, ölçme-değerlendirme dersi, tutum, özyeterlik algısı

Abstract

The aim of this study was to determine the effect of 5E model based on context-based instruction approach the attitudes and perception of self-efficacy of pre-service teachers towards the assessment and evaluation course. For this purpose, appropriate contexts for the assessment-evaluation course topics have been prepared and the lessons have been taught in accordance with 5E model based on context-based instruction approach. The study group consists of 30 students who were studying in the third year of the department of science education in Kilis 7 Aralik University in the spring semester of 2017-2018 academic years. The one-group pre-test post-test pre-experimental designs were utilized as the research method in the study. The application lasted approximately four weeks. Self-Efficacy Perception Scale for Assessment and Evaluation in Education and Self-Efficacy Perception Scale for Assessment and Evaluation in Education were used as the measurement tools. The obtained data were analyzed with dependent groups t test. As a result of the study, it was determined that the 5E model based on the context-based teaching approach was statistically significant in the attitudes of the students towards the assessment and evaluation course and in the self-efficacy perception pre-test and post-test average.

Keywords: context-based instruction approach, 5E model, assessment and evaluation course, attitudes, perception, self-efficacy

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Atıf / Citation: Dede, H. (2019). Yaşam temelli öğretim yaklaşımına dayalı 5e modeli kullanımının öğretmen adaylarının ölçme değerlendirme dersine yönelik tutum ve özyeterlik algıları üzerine etkisinin incelenmesi .*Kastamonu Education Journal, 27*(6), 2547-2558. doi:10.24106/kefdergi.3432

Extended Abstract

Assessment and evaluation is required in all of the input, process and product dimensions of the education process (Guler & Gelbal, 2010). Therefore, it is necessary that all teacher candidates' assessment and evaluation concepts should be internalized before they become involved in the education process as a teacher in order to create effective learning environments (Çalışkan & Üstündağ, 2010). In addition, pre-service teachers should be able to use some of their special knowledge in the field of assessment and evaluation well enough, develop some skills in this field and have positive attitudes (Turgut & Baykul, 2012, p.3).

Attitude is the emotional readiness or tendency of individuals to accept or reject a particular person, group, institution, or thought (Baykul, 1990; Özgüven, 1994). In-service and pre-service teachers' affective attitude towards assessment and evaluation is as important as the assessment and evaluation competence (Süral, 2014).

The self-efficacy belief was defined by Bandura (1977) as a sense of personal trust that individuals feel as if they are aware of their current potential and that they can accomplish a task successfully. Individuals' perceptions of self-efficacy on a subject affect many affective situations such as the attitude, motivation and perception of that individual. The studies conducted on this subject show that the high self-efficacy of the teachers enables the teachers to develop their classroom behaviors and positive attitude towards teaching and also positively affect the success and attitude of the students (Başman & Tavşancıl, 2016; Gibson & Dembo, 1984; Morgil, Seçken & Yücel, 2004; Tschannen-Moran, Hoy & Hoy, 1998).

Previous studies in the field of assessment and evaluation show that the studies carried out in order to determine assessment and evaluation competence, attitudes towards assessment and evalutiaon, the effect of assessment and evaluation tools and opinions of assessment and evaluation (Akdağ, 2011; Akdağ & Ekmekçi, 2015; Aydın, 2001; Güneş, 2007; Karaca, 2003; Köksal, 2009; Ozan & Kıncal, 2017; Ulutaş, 2003; Zhang & Burry-Stock, 2003). Few studies have been found on the effect of the use of modern teaching methods in the assessment and evaluation course (Çalışkan & Üstündağ, 2010; Demir, 2012).

One of the modern teaching methods is 5E model. 5E model is based on a context-based instruction approach. The aim of the context-based instruction approach, which was initially developed as a program development approach based on the constructivist approach, and then became a learning-teaching approach, is to increase the students' desire to learn the subject by giving scientific concepts and subjects through selected contexts from daily life (Barker & Millar, 1999; Kutu & Sözbilir, 2011). The 5E teaching model was developed by Bybee (1993) and consists of five stages: Engage, Explore, Explain, Elaborate and Evaluate.

The aim of this study was to determine the effect of 5E model based on context-based instruction approach the attitudes and perception of self-efficacy of pre-service teachers towards the assessment and evaluation course. For this purpose, appropriate contexts for the assessment-evaluation course topics have been prepared and the lessons have been taught in accordance with 5E model based on context-based instruction approach. The study utilized single-group pretest-posttest design, which is one of the weak experimental designs. The study group consisted of 30 students in the third year of science education in Kilis 7 Aralik University in the spring semester of 2017-2018 academic years. In order to collect data for the present study, Attitude Scale for Assessment and Evaluation in Education Course (AS-AEEC) and Self-Efficacy Perception Scale for Assessment and Evaluation in Education Course (SEPS-AEEC) were used. The weekly course periods of the assessment and evaluation course were 3, and the application lasted for 12 course periods. In the study with no control group, the courses for the experiment group were taught in accordance with the 5E model based on the context-based instruction approach.

Three contexts which were related to statistics, validity and reliability subjects prepared were presented to the students during the engage stage of the course to attract their attention to the subject. During the explore stage of the course, the students were asked to define the definitions of the concepts in the context of the engage stage. In the explain stage of the course, the definitions of the concepts determined by the students are examined, and the defective definitions are corrected and explained. In the elaborate stage of the course, information about the use of the concepts in the context of daily life was given and the open-ended problems were solved with statistical concepts. In the final, evaluate stage of the course, students were asked to solve multiple-choice questions related to concepts.

The significance of the difference between the averages scores of each scale was analyzed by dependent groups t-test, because of the data presented normal distribution. As a result of the study, it was determined that the 5E model based on the context-based teaching approach was statistically significant in the attitudes of the students towards the assessment and evaluation course and in the self-efficacy perception pre-test and post-test average. The literature re-

view conducted for the present study on the use of 5E model showed that the findings of the present study are in agreement with the findings of Sağlam's (2006) and Yalçın's (2010) findings on the attitudes towards science course, Akar's (2005) and Yörük's (2008) findings on the attitudes towards chemistry course, Yalçın, Açışlı and Turgut's (2010) and Bal's (2012) findings on the attitudes towards physics lab course, and Öztürk's (2008) findings on the attitudes towards geography course. It can be claimed that this finding is resulted from students' active participation in the lesson according to context-based instruction approach, which is based on constructivist approach and, the discovery and knowledge of information themselves. Accordingly, we can claim that starting with a context from daily life attracts students' attention to the lesson and that increasing interest has a positive effect on the attitudes towards the course. Another finding of the present study is that, the use of 5E model based on context-based instruction approach in assessment and evaluation courses increased pre-service teachers' self-efficacy perceptions of assessment and evaluation. This finding is in agreement with the findings obtained in the study conducted by Usta Gezer (2014). It can be claimed that finding was believed to have resulted from the fact that in the elaborate stage of 5E model, problem-solving environments were created for students, and students solved open-ended questions related to the subject, as students' problem-solving skills develop by solving problems. The more developed the problem-solving skills are, the more self-efficacy perception the students have (Altunçekiç, Yaman, & Koray, 2005). According to the results of this study, some suggestions were made to the researchers who would like to do similar studies in this area.

1. Introduction

Assessment is the process of observing any attribute and expressing the result of observation with numbers or adjectives, and evaluation is the process of making a value judgment about the measured attribute by expressing the results of the measurement on a criterion or criteria (Turgut & Baykul, 2012, p.3). Assessment and evaluation is required in all of the input, process and product dimensions of the education process (Guler & Gelbal, 2010). Therefore, it is necessary that all teacher candidates' assessment and evaluation concepts should be internalized before they become involved in the education process as a teacher in order to create effective learning environments (Çalışkan & Üstündağ, 2010). In addition, pre-service teachers should be able to use some of their special knowledge in the field of assessment and evaluation well enough, develop some skills in this field and have positive attitudes (Turgut & Baykul, 2012, p.3). If the teachers are competent in the field of assessment and evaluation, they can facilitate the learning activities, measure the students' learning with the right methods and techniques and make an accurate evaluation. Moreover, the correct assessment and evaluation by the teacher will provide information about not only the success of the students but also the functioning of the education system (Akdağ, 2011).

Attitude is the emotional readiness or tendency of individuals to accept or reject a particular person, group, institution, or thought (Baykul, 1990; Özgüven, 1994). In-service and pre-service teachers' affective attitude towards assessment and evaluation is as important as the assessment and evaluation competence (Süral, 2014).

The self-efficacy belief was defined by Bandura (1977) as a sense of personal trust that individuals feel as if they are aware of their current potential and that they can accomplish a task successfully. Self-efficacy is related to the judgments of individuals about how well they can do the necessary actions to cope with a possible situation (Bıkmaz, 2002). Individuals with low self- efficacy are afraid of taking on challenging tasks and consider these as personal threats. When faced a challenging task, rather than what success they will put, they think of their shortcomings, the obstacles they may face and the bad consequences that may occur (Bandura, 1995, p.11). Individuals with high self-efficacy tend to face challenging tasks as challenges that must be overcome, rather than as threats that should be avoided (Bandura, 1995, p.39). Individuals' perceptions of self-efficacy on a subject affect many affective situations such as the attitude, motivation and perception of that individual. The studies conducted on this subject show that the high self-efficacy of the teachers enables the teachers to develop their classroom behaviors and positive attitude towards teaching and also positively affect the success and attitude of the students (Başman & Tavşancıl, 2016; Gibson & Dembo, 1984; Morgil, Seçken & Yücel, 2004; Tschannen-Moran, Hoy & Hoy, 1998).

Previous studies in the field of assessment and evaluation show that the studies carried out in order to determine assessment and evaluation competence, attitudes towards assessment and evalutiaon, the effect of assessment and evaluation tools and opinions of assessment and evaluation (Akdağ, 2011; Akdağ & Ekmekçi, 2015; Aydın, 2001; Güneş, 2007; Karaca, 2003; Köksal, 2009; Ozan & Kıncal, 2017; Ulutaş, 2003; Zhang & Burry-Stock, 2003). Few studies have been found on the effect of the use of modern teaching methods in the assessment and evaluation course. For instance, Çalışkan and Üstündağ (2010) used the creative drama method in the assessment and evaluation course and reported that the success, change and development of the teacher candidates' cognitive and affective dimensions varied by using the creative drama method. Demir (2012) used creative drama and Jigsaw II techniques in his assessment and evaluation course and obtained positive opinions from students about the new combined method.

The aim of the context-based instruction approach, which was initially developed as a program development approach based on the constructivist approach, and then became a learning-teaching approach, is to increase the students' desire to learn the subject by giving scientific concepts and subjects through selected contexts from daily life (Barker & Millar, 1999; Kutu & Sözbilir, 2011). Since the concepts, contexts and subjects are presented in different directions and relationships, the concepts and subjects are no longer abstract for the students. Therefore, determining or forming the context is very important. When forming the context, it should be ensured that it is selected from the appropriate age level and a situation known to the student. In addition, the context should not be confusing and should not distract the student from the relevant subject and concept (De Jong, 2008).

It is necessary to utilize a suitable teaching model in practicing the context-based instruction approach. According to the related literature, 5E model is the most frequently used model in context-based instruction approach practices (Kistak, 2014), and there are also studies using REACT strategy (Demircioğlu, Vural, & Demircioğlu, 2012) and ARCS motivation model (Kutu, 2011). The 5E teaching model was developed by Bybee (1993) and consists of five stages: Engage, Explore, Explain, Elaborate and Evaluate. The model was named after the initials of these 5 stages. Engage stage is the stage where students 'interests are attracted to the subject and the students' prior knowledge is revealed. Explore is

the stage in which students discover scientific knowledge, at which point the students will experiment with individual or group information, make observations, solve problems and gain experience. Explain is the stage where the teacher is the most active, and they ask the students to share the data from their own experience during the introduction and discovery, and help them to make the necessary explanations to replace the inadequate or inaccurate thoughts with the right ones. Elaborate is the stage where students adapt the new information they learn to different situations and associate them with daily life. Evaluate is the stage in which the teacher helps the students to evaluate their own development, in which they question the new knowledge they have learned. At this stage, while the students are solving the problem, the teacher monitors them and asks them questions (Ayvacı & Bakırcı, 2012; Bybee, 2002; Krantz, 2004; Şahin & Çepni, 2012). Studies have shown that the 5E model has a positive effect on students' achievement in the course, their attitudes towards the course, their motivation and self-efficacy. Although it is of critical importance in the education process, there is little emphasis on how the assessment and evaluation course will be taught (Demir, 2012). For this reason, teachers cannot perform sufficient proficiency in the assessment and evaluation process (Karaca, 2003; Tabak, 2007). Teaching of assessment and evaluation course through 5E model based on the context-based instruction approach is believed to contribute to the training of pre-service teachers positively. Additionally, since there no studies on the teaching of assessment and evaluation course through 5E model in the national and international literature, findings of the present research is believed to provide important contributions to the literature in terms of the application areas of 5E model.

Research Problem

Is the use of a 5E model based on context-based instruction approach effective on the attitudes of the pre-service teachers towards the assessment and evaluation course and their self-efficacy perceptions?

Sub-problems

1. Is there a significant difference between pre-service teachers' pre-test and post-test average scores from Attitude Scale for Assessment and Evaluation in Education Course, which measures the attitudes towards assessment and evaluation in education course?

2. Is there a significant difference between pre-service teachers' pre-test and post-test average scores from Self-Efficacy Perception Scale for Assessment and Evaluation in Education Course, which measures the self-efficacy perceptions related to assessment and evaluation in education course?

Assessment and Evaluation, which constitutes one of the four pillars of the curriculum, has an important place in teaching. Every teacher should have a high level of knowledge in the field of assessment and evaluation. However, studies have shown that most of the teachers are not competent enough in the field of assessment and evaluation (Arslantaş, 2011; Gelbal & Kellecioğlu, 2007; Kilmen & Demirtaşlı, 2009). The reason for this failure may be the lack of sufficient knowledge in the field of assessment and evaluation, or the lack of self-efficacy or positive attitudes towards assessment and evaluation. It is observed that modern teaching methods and techniques are not used in the assessment and evaluation course. The fact that the present study may define the effects of the use of 5E model based on context-based instruction approach, which is one of the modern teaching methods and techniques, on solving these problems increases the importance of the present study. It is believed that the findings to be obtained at the end of the study will provide a different perspective to the experts and academicians in the field of assessment and evaluation. Moreover, according to the related literature, majority of the studies on contemporary teaching methods are related to the use of these methods in the teaching of major area courses. Since the present study investigates the effects of using modern teaching methods in a pedagogical formation course, rather than a major area course, it is expected to provide great contributions to the related literature.

2. Method

Research Design

The present study utilized single-group pretest-posttest design, which is one of the weak experimental designs. According to this design, experimental procedures are practices on a single group, without a control group. The same measurement tools are applied as pre-test and post-test before and after the application and the measurements for the dependent variable of the subjects in the study group are obtained (Büyüköztürk et al., 2008). Table 1 presents the experimental design applied in the present study.

Table 1. Experimental design

Pre-test	Experimental Procedure	Post-test
Attitude Scale for Assessment and Evaluation in Education Course (AS-AEEC)	5E Model Based on Context-Based Instruction Approach	Attitude Scale for Assessment and Evaluation in Education Course (AS-AEEC)
Self-Efficacy Perception Scale for Assessment and Evaluation in Education Course (SEPS-AEEC)		Self-Efficacy Perception Scale for Assessment and Evaluation in Education Course (SEPS-AEEC)

Study Group

The study group consisted of 30 students in the third year of science education in Kilis 7 Aralik University in the spring semester of 2017-2018 academic years.

Data Collection Tools

In order to collect data for the present study, Attitude Scale for Assessment and Evaluation in Education Course (AS-AEEC) and Self-Efficacy Perception Scale for Assessment and Evaluation in Education Course (SEPS-AEEC) were used.

Attitude scale for assessment and evaluation in education course (AS-AEEC)

EÖDDY-TÖ, which is used as pre-test and post-test, was developed by Yaşar (2011) in order to determine the attitudes towards the assessment-evaluation course of the students. The Cronbach's alpha reliability coefficient of the scale consisting of 20 Likert-type items was found as 0.942. The scale has three sub-dimensions: negative approach (11 items), importance (5 items) and cognitive competence (4) and Cronbach alpha reliability values of these dimensions are 0.93, 0.88, and 0.80, respectively. In the present study, the Cronbach Alpha reliability coefficient of the pre-test was calculated as 0.86, and the Cronbach Alpha reliability coefficient of the post-test was calculated as 0.94.

Self-efficacy perception scale for assessment and evaluation in education course (SEPS-AEEC)

In order to determine the self-efficacy perceptions of the students for the present study, SEPS-AEEC developed by Kılınç (2011) was administered as pre-test and post-test. The 23-item Likert-type scale consists of two sub-dimensions: knowledge-based self-efficacy and skill-based self-efficacy. The Cronbach alpha coefficient of the whole scale was 0.96 while the Cronbach alpha coefficient of the knowledge-based self-efficacy scale was 0.93 and the Cronbach alpha coefficient of the skill-based self-efficacy dimension was calculated as 0.95. In the present study, the Cronbach's alpha reliability coefficient of the pre-test was 0.94, and the Cronbach's alpha reliability coefficient of the post-test was calculated as 0.95.

Scope of the Study and Implementation Process

The weekly course periods of the assessment and evaluation course were 3, and the application lasted for 12 course periods. In the study with no control group, the courses for the experiment group were taught in accordance with the 5E model based on the context-based instruction approach. Before the application, a context was developed for each topic in the scope of the study and the totals of three contexts were prepared. Table 2 presents the titles, the subjects and the concepts of the contexts used in the application.

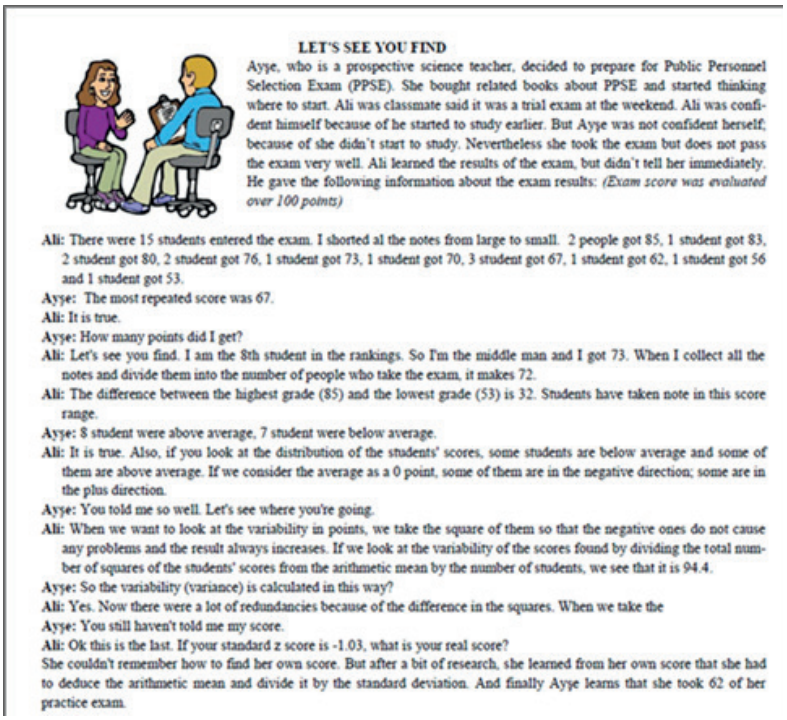
Table 2. The titles, the subjects and concepts of the contexts used in the application

The Title of Context	The Subject	The Concept
Let's See You Find	Statistics	Mode, Median, Mean, Range, Standard Deviation, Standard Score
Knowledge Contest	Validity	Conformity validity, Predictive validity
The Most Accurate Test	Reliability	Reliability calculation methods (test half method), Reliability Coefficient, Factors affecting reliability

The present study covers three subjects: Statistics, validity and reliability. For the subject of Statistics, the context titled Let's See You Find is prepared. This context includes the concepts of mode, median, mean, range, standard deviation and standard score. In the context, all the concepts to be given in statistics were included. For the subject of Validity, the context titled Knowledge Contest is prepared. This context includes the concepts of conformity validity and predictive validity. In the context, all concepts in the subject of Validity were not included, therefore the description

of content/scope validity, construct validity, appearance validity and factors affecting validity concepts were given in the explain stage. For the subject of Reliability, the context titled Knowledge Contest is prepared. This context includes the concepts of reliability calculation methods (test half method), reliability coefficient and factors affecting reliability. In the context, all concepts in the subject of Reliability were not included, therefore the description of error in measurement and the other reliability calculation methods concepts were given in the explain stage. The processing of each subject took 4 hours. The implementation process of statistics with 5E Model Based on Context-Based Instruction Approach is summarized below.

The engage stage: The students were asked to read the context of Let's See You Find carefully. In this way, students' attention has been drawn to the subject.



LET'S SEE YOU FIND

Ayşe, who is a prospective science teacher, decided to prepare for Public Personnel Selection Exam (PPSE). She bought related books about PPSE and started thinking where to start. Ali was classmate said it was a trial exam at the weekend. Ali was confident himself because of he started to study earlier. But Ayşe was not confident herself, because of she didn't start to study. Nevertheless she took the exam but does not pass the exam very well. Ali learned the results of the exam, but didn't tell her immediately. He gave the following information about the exam results: *(Exam score was evaluated over 100 points)*

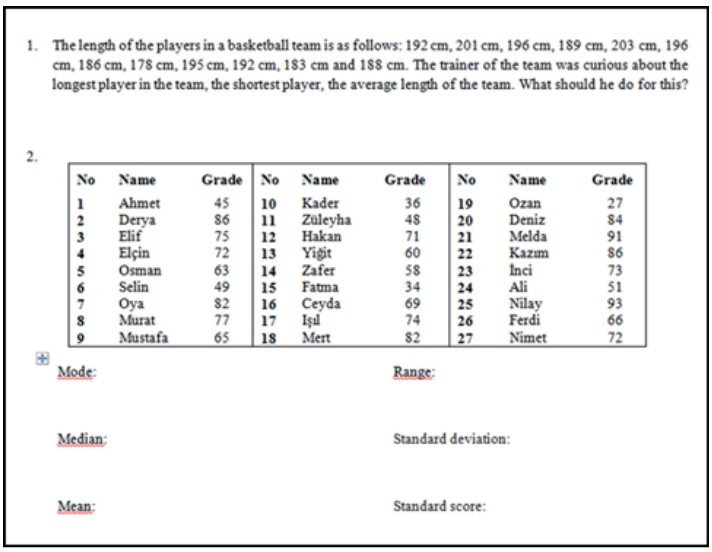
Ali: There were 15 students entered the exam. I shorted al the notes from large to small. 2 people got 85, 1 student got 83, 2 student got 80, 2 student got 76, 1 student got 73, 1 student got 70, 3 student got 67, 1 student got 62, 1 student got 56 and 1 student got 53.
Ayşe: The most repeated score was 67.
Ali: It is true.
Ayşe: How many points did I get?
Ali: Let's see you find. I am the 8th student in the rankings. So I'm the middle man and I got 73. When I collect all the notes and divide them into the number of people who take the exam, it makes 72.
Ali: The difference between the highest grade (85) and the lowest grade (53) is 32. Students have taken note in this score range.
Ayşe: 8 student were above average, 7 student were below average.
Ali: It is true. Also, if you look at the distribution of the students' scores, some students are below average and some of them are above average. If we consider the average as a 0 point, some of them are in the negative direction; some are in the plus direction.
Ayşe: You told me so well. Let's see where you're going.
Ali: When we want to look at the variability in points, we take the square of them so that the negative ones do not cause any problems and the result always increases. If we look at the variability of the scores found by dividing the total number of squares of the students' scores from the arithmetic mean by the number of students, we see that it is 94.4.
Ayşe: So the variability (variance) is calculated in this way?
Ali: Yes. Now there were a lot of redundancies because of the difference in the squares. When we take the
Ayşe: You still haven't told me my score.
Ali: Ok this is the last. If your standard z score is -1.03, what is your real score?
She couldn't remember how to find her own score. But after a bit of research, she learned from her own score that she had to deduce the arithmetic mean and divide it by the standard deviation. And finally Ayşe learns that she took 62 of her practice exam.

Figure 1. The context used in the engage stage

The explore stage: At this stage, students were told that each of the calculations in the context belonged to a separate statistical concept and the students were asked to explain what these concepts are and their definitions. The calculations in the context belong to mode, median, mean, range, standard deviation and standard score concepts and students were expected to explore these concepts.

The explain stage: At this stage, the definitions of the concepts determined by the students are examined. In general, it was observed that the students made the concepts of median, mean, standard deviation and their explanations correctly, but they had errors in the mode, range, standard score concept. The defective definitions are corrected and explained.

The elaborate stage: At this stage, information about the use of the concepts in the context of daily life was given and the open-ended problems were solved with statistical concepts. In this way, the new knowledge that the students have learned is adapted to different situations and associated with daily life.



1. The length of the players in a basketball team is as follows: 192 cm, 201 cm, 196 cm, 189 cm, 203 cm, 196 cm, 186 cm, 178 cm, 195 cm, 192 cm, 183 cm and 188 cm. The trainer of the team was curious about the longest player in the team, the shortest player, the average length of the team. What should he do for this?

2.

No	Name	Grade	No	Name	Grade	No	Name	Grade
1	Ahmet	45	10	Kader	36	19	Ozan	27
2	Derya	86	11	Züleyha	48	20	Deniz	84
3	Elif	75	12	Hakan	71	21	Melda	91
4	Elçin	72	13	Yiğit	60	22	Kazım	86
5	Osman	63	14	Zafer	58	23	İnci	73
6	Selin	49	15	Fatma	34	24	Ali	51
7	Oya	82	16	Ceyda	69	25	Nilay	93
8	Murat	77	17	Işıl	74	26	Ferdi	66
9	Mustafa	65	18	Mert	82	27	Nimet	72

Mode: Range:

Median: Standard deviation:

Mean: Standard score:

Figure 2. The material used in the elaborate stage

The evaluate stage: At this stage, firstly students were asked to solve multiple choice questions related to the concepts they had recently learned. Then the questions are resolved on the board. In case students made mistakes, the students were given the necessary clues. In this way, the students were helped to reach the correct result.

Data Analysis

In order to test the first and second sub-problems of the present study, the differences and the standard deviations between the averages of pre-test and post-test scores for AS-AEEC and SEPS-AEEC were calculated. Shapiro-Wilks test was used to determine whether the scores fit the normal distribution as the sample size was smaller than 50. Since the scores fit the normal distribution, the significance of the difference between the average scores of each scale was analyzed by dependent groups t test (Büyüköztürk, 2009).

3. Findings

This part present the findings of the analyses for the data obtained for the present study. The results of the students' pre-test-post-test averages for AS-AEEC and SEPS-AEEC, standard deviation, Shapiro-Wilks and normality test are presented in Table 3.

Table 3. AS-AEEC and SEPS-AEEC pre-test and post-test averages, standard deviation values, shapiro-wilks and normality test results

Scales		n	x̄	sd	Shapiro Wilk	
					Statistic	p
AS-AEEC	Pre-test	29	3.46	0.42	0.968	.513*
	Post-test	29	3.85	0.63	0.940	1.00*
SEPS-AEEC	Pre-test	28	3.12	0.47	0.971	.602*
	Post-test	28	3.80	0.55	0.963	.411*

As presented in Table 3, pre-test and post-test results of attitude and self-efficacy scales fit normal distribution (Shapiro Wilk values are *p>.05*). In Table 4, skewness and kurtosis coefficients for AS-AEEC and SEPS-AEEC pre-test and post-test scores are presented.

Table 4. Skewness and kurtosis coefficients for AS-AEEC and SEPS-AEEC pre-test and post-test scores

		Skewness		Kurtosis	
		Statistic	Standard Error	Statistic	Standard Error
AS-AEEC	Pre-test	-.181	.434	-.415	.845
	Post-test	-.814	.434	.439	.845
SEPS-AEEC	Pre-test	-.579	.441	.070	.858
	Post-test	-.141	.441	.912	.858

As presented in Table 4, the values of skewness and kurtosis coefficients of the pre-test and post-test scores of both

AS-AEEC and SEPS-AEEC were between -1 and +1.

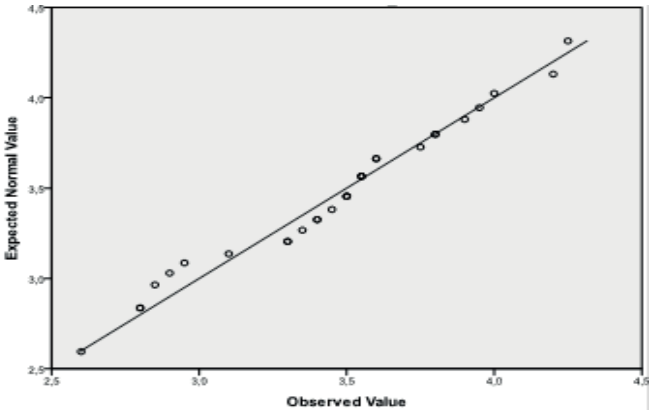


Figure 3. AS-AEEC pre-test q-q plots graph

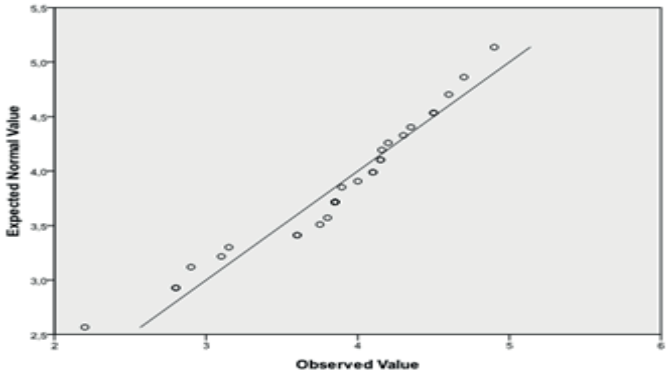


Figure 4. AS-AEEC post-test q-q plots graph

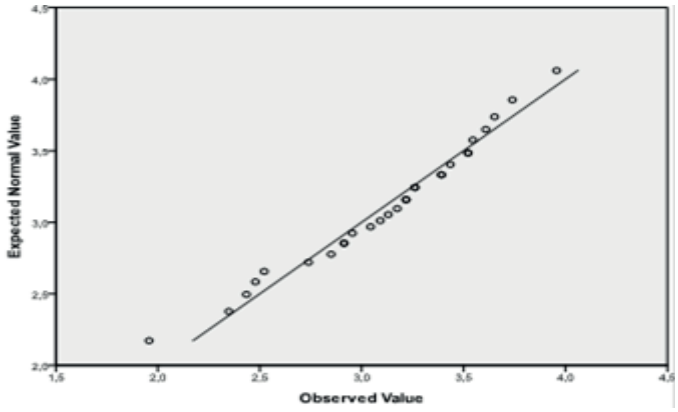


Figure 5. SEPS-AEEC pre-test q-q plots graph

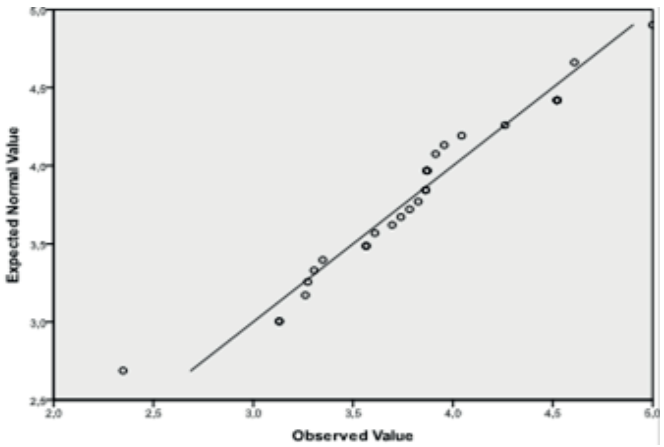


Figure 6. SEPS-AEEC post-test q-q plots graph

Figures 1, 2, 3 and 4 present q-q plots graphs showing that the pre-test-post-test data of both AS-AEEC and SEPS-AEEC distributed normally. Shapiro Wilk test skewness and kurtosis coefficients and q-q plots graphs were analyzed, and it was found that the data presented normal distribution. For this reason, parametric tests were used for the analysis of the data obtained for the present study (Kalaycı, 2009).

In order to study the effect of 5E model based on context-based instruction approach on the attitudes of pre-service teachers, the significance of the difference between the AS-AEEC pre-test and post-test score averages was tested with dependent groups t test. Table 5 presents the independent groups t test results for pre-test and post-test scores of AS-AEEC.

Table 5. Dependent groups t test results for pre-test and post-test scores of AS-AEEC

AS-AEEC	n	x̄	ss	sd	t	p
Pre-Test	29	3.46	0.42	28	-3.486	.002
Post-Test	29	3.85	0.63			

According to dependent groups t-test results of the AS-AEEC pre-test and post-test scores of the students presented in Table 5, there is a statistically significant difference in favor of post-test (t (29) = -3.486; *p=0.002*; p <.05).

Table 6. Dependent groups t test results for pre-test and post-test scores of SEPS-AEEC

SEPS-AEEC	n	x̄	ss	sd	t	p
Pre-Test	28	3.12	0.47	27	-5.816	.000
Post-Test	28	3.80	0.55			

According to dependent groups t-test results of the SEPS-AEEC pre-test and post-test scores of the students presented in Table 6, there is a statistically significant difference in favor of post-test (*t*(28)= -5.816; *p=0.000*; p<.05).

4. Results and Discussion

Findings obtained in the present study show that using 5E model based on context-based instruction approach in assessment and evaluation course positively affects attitudes of pre-service teachers towards assessment and evaluation course. According to the related literature, no studies have been conducted on the effects of 5E model on the attitudes towards assessment and evaluation course, while there have been several studies on the effects on 5E model on the attitudes towards science (physics, chemistry, biology, environmental sciences) course. According to the findings of the meta-analysis study conducted by Ayaz (2015) in order to determine the effect of a 5E-learning model on students 'attitudes towards classes, 5E-learning model has a more positive effect on students' attitudes than traditional teaching methods. The literature review conducted for the present study on the use of 5E model showed that the findings of the present study are in agreement with the findings of Sağlam's (2006) and Yalçın's (2010) findings on the attitudes towards science course, Akar's (2005) and Yörük's (2008) findings on the attitudes towards chemistry course, Yalçın, Açışlı and Turgut's (2010) and Bal's (2012) findings on the attitudes towards physics lab course, and Öztürk's (2008) findings on the attitudes towards geography course. It can be claimed that this finding is resulted from students' active participation in the lesson according to context-based instruction approach, which is based on constructivist approach and, the discovery and knowledge of information themselves. Accordingly, we can claim that starting with a context from daily life attracts students' attention to the lesson and that increasing interest has a positive effect on the attitudes towards the course.

Another finding of the present study is that, the use of 5E model based on context-based instruction approach in assessment and evaluation courses increased pre-service teachers' self-efficacy perceptions of assessment and evaluation. This finding is in agreement with the findings obtained in the study conducted by Usta Gezer (2014). In the study conducted by Usta Gezer (2014), the course of general biology laboratory was carried out using the 5E Model in the experimental group and the traditional method in the control group. According to the findings of the study, a statistically significant difference was found in the self-efficacy average of the students in the experimental group compared to the students in the control group. It can be claimed that finding was believed to have resulted from the fact that in the elaborate stage of 5E model, problem-solving environments were created for students, and students solved open-ended questions related to the subject, as students' problem-solving skills develop by solving problems. The more developed the problem-solving skills are, the more self-efficacy perception the students have (Altunçekiç, Yaman, & Koray, 2005).

Consequently, according to the findings of the present study, 5E model based on context-based instruction approach has positive effects on pre-service teachers' attitudes towards and self-efficacy perceptions of the assessment and evaluation course. Based on the findings of the present study, following suggestions can be made for researchers who would like to conduct similar studies in the field:

i. Studies on the effect of 5E model based on context-based instruction approach on students' academic achievement, persistence of knowledge, interest and motivation can be conducted.

ii. Reasons for the positive or negative effects of the model can be studied using qualitative data collection tools (interview, observation, etc.).

iii. For the present study, statistics, validity and reliability subjects of assessment and evaluation were taught in accordance with 5E model based on context-based instruction approach. Further studies can be conducted by teaching other assessment and evaluation subjects in accordance with this model.

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