

Education Themed Movies as a Teaching Material for Pre-Service Science Teacher Education*

Fen Bilgisi Öğretmen Adaylarının Eğitiminde Bir Öğretim Materyali Olarak Eğitim Temalı Filmler

Ridvan ELMAS**



Muhammet Emin TURKOGLU***



Bulent AYDOGDU****



Received: 08 February 2019

Research Article

Accepted: 04 August 2019

ABSTRACT: Educational media has the potential to foster pre-service science teacher education in many ways. The purpose of this study was to explore the possibility of using selected movies as an educational media and resource for pre-service science teacher education as an extracurricular activity, and therefore five selected movies were used as a backbone for a seven-week training. The sample of the study consisted of 60 pre-service science teachers who attended this training. The data were collected through 3 instruments as pre and posttests. These are Teachers' Sense of Efficacy Scale (TSES), The Science Teaching Efficacy Belief Instrument (STEBI) and Draw-A-Science-Teacher-Test-Checklist (DASTT-C), respectively. For the first two instruments, a dependent t-test was carried out as a statistical procedure with SPSS. The DASTT-C drawings were evaluated according to its scoring sheet. The results indicated that there is a statistically significant increase in both pre-service science teachers' efficacy beliefs and their science teaching efficacy beliefs based on our statistical analysis. Pre-service science teachers presented more student-centered instructional style qualifications after the training.

Keywords: Movies, pre-service science teacher education, teachers' sense of efficacy scale, science teaching efficacy belief, draw-a-science-teacher-test-checklist.

ÖZ: Eğitime dayalı medya araçları öğretmen adaylarının potansiyellerini geliştirmede etkili bir araçtır. Bu çalışmanın amacı, fen bilgisi öğretmen adaylarının eğitiminde öğretim programını desteklemek amacıyla seçilen bazı filmlerin öğretim aracı olarak kullanılmasıdır. Bu bağlamda seçilen beş film, yedi haftalık eğitimin ana unsurunu oluşturmaktadır. Araştırmanın örneklemini, 60 fen bilgisi öğretmen adayı oluşturmaktadır. Veriler, ön-test ve son-test olarak üç veri toplama aracıyla toplanmıştır. Araştırmada kullanılan ölçekler, Öğretmen Öz-yeterlik Ölçeği (ÖÖÖ), Fen Öğretimi Öz-Yeterlik İnancı Ölçeği (FÖYİÖ), Fen Öğretmeni Olarak Kendini Çizme Testi (DASTT-C) şeklindedir. İlk iki ölçek için, SPSS istatistiksel paket programı ile bağımlı örneklemler t testi yapılmıştır. DASTT-C çizimleri için ise, dereceli ölçeğe göre değerlendirilmiştir. Sonuçlar, fen bilgisi öğretmen adaylarının hem öğretmen öz-yeterlik inanç son test puanlarında hem de fen öğretimi öz-yeterlik inanç son test puanlarında anlamlı farklılıklar olduğunu göstermiştir. Eğitimden sonra, fen bilgisi öğretmen adaylarının daha fazla öğrenci merkezli öğretim tarzı sergiledikleri görülmüştür.

Anahtar Sözcükler: filmler, fen bilgisi öğretmen adaylarının eğitimi, öğretmen öz-yeterlik ölçeği, fen öğretimi öz-yeterlik inancı, fen öğretmeni olarak kendini çizme testi.

* This study was funded by Afyon Kocatepe University Scientific Projects Coordination Center (Project Number: 16.EGT.03). Besides, this study was presented as an oral presentation in 5th International Eurasian Educational Research Congress (EJER) 2018.

** Asst. Prof. Dr., Afyon Kocatepe University, Afyonkarahisar, Turkey, relmas@aku.edu.tr, <https://orcid.org/0000-0001-7769-2525>

*** Corresponding Author: Asst. Prof. Dr., Afyon Kocatepe University, Afyonkarahisar, mturkoglu@aku.edu.tr, <https://orcid.org/0000-0003-3883-3414>

**** Assoc. Prof. Dr., Afyon Kocatepe University, Afyonkarahisar, baydogdu@aku.edu.tr, <https://orcid.org/0000-0003-1989-6081>

Citation Information

Elmas, R., Turkoglu, M. E., & Aydogdu, B. (2019). Education themed movies as a teaching resource for pre-service science teacher education. *Kuramsal Eğitim Bilim Dergisi [Journal of Theoretical Educational Science]*, 12(4), 1324-1339.

Introduction

Teachers support students to develop their abilities, attitudes and other forms of behavior (Yildirim & Koklukaya, 2017). Teachers are seen as the most important stakeholders in the education of students (Karatas, Ardic, & Oral, 2017). As it is known, teaching is a profession that has many qualities in different dimensions. It is crucial that pre-service teachers who are trained in the faculties of education realize that their experience in teaching cannot be achieved only with a limited number of courses taken at school. When pre-service teachers exhibit a positive attitude towards their profession, it is clear that they are more likely to be more successful in the teaching profession. Therefore, there is a need for activities and good examples where pre-service teachers can see the difference between real teaching at schools and practice at faculties. One of the sources that can meet this need is the use of movies in the education of pre-service teachers. Especially teacher and school themed movies are thought to be a rich source for pre-service teachers (Berk, 2009). The use of movies in the teaching process dramatically enhances the communication between the teacher and the student (Blasco, Moreto, Blasko, Levites, & Janaudis, 2015). As it is known, life in schools predominantly takes place in classrooms. When it is considered that teachers and students interact for long hours at school, the time and quality of education should be enhanced. The main factor that will increase this duration and quality is teachers' classroom management skills. It is stated that these skills have a crucial importance in attracting the attention of the students, fostering goal orientation, increasing class participation, creating a healthy class climate and transforming students into productive individuals (Acikgoz, Ozkal & Kilic, 2003; Evertson, Emmer, Sanford, & Clements, 1983; Sahin & Ozbay, 1999). Classroom management skills are a concept that makes learning environments healthy in classrooms. These skills also direct students by applying the class rules. Effective classroom management skills allow teachers to take measures to ensure that their education and training activities are carried out efficiently to positively direct their behaviors and thoughts as a model to their students in the classroom.

Classroom management skills include many methods and activities. In particular, supervising the fulfillment of the responsibilities assigned to the students and implementing methods and techniques that facilitate teaching are among the primary ones (Shechtman & Leichtentritt, 2004). In addition to this, reminding students, taking care of them individually, ensuring that they have access to the right resources in subjects with learning needs are also used (Turnuklu & Yildiz, 2002). Teachers sometimes do not intervene in a class by classifying events and accepting specific problems under the tolerable threshold. They take some precautions by attracting the attention of the class inappropriate times or by making personal warnings. As an example of the measures that teachers take in the classroom, effective classroom rules can be shown (Gable, Hester, Rock, & Hughes, 2009). On the other hand, it is known that many teachers recognize their students individually and act needs-oriented (Sahin & Ozbay, 1999). Effective communication is an undeniable fact of increasing the efficiency of students in classroom settings (Alderman & Green, 2011). In the light of these considerations, to enable teachers to develop effective and fast strategies in the classroom management, which has become more complicated in the present day,

activities should be carried out for pre-service teachers based on today's knowledge and research results.

Teachers' self-efficacy, which is related to classroom management skills that provide teachers' effectiveness within the classroom, is another factor that causes teachers to make the classroom climate healthier (Hoy & Spero, 2005; Roberts & Henson, 2001; Woolfolk & Hoy, 1990; Woolfolk, Rosoff, & Hoy, 1990). Teachers' high self-efficacy has positive effects on their students as well as supporting educational and teaching processes. It is stated that self-efficacy is highly effective in achieving the goals and classroom management (Hoy & Spero, 2005; Roberts & Henson, 2001; Savran & Cakiroglu, 2003). It is suggested that teachers with high self-efficacy will also have high classroom management skills (Blackbourn et. al. 2007). Based on the idea that teachers' self-efficacy and classroom management skills are fundamental in the school and classroom environments where future generations grow, it is critical to organize different learning-teaching activities with rich learning and teaching objectives. It is also essential to improve the qualifications of pre-service teachers who will prepare their students for the future in the best possible way.

In the literature, the concept of efficacy is used in the form of teaching effectiveness, general competence, personal competence, teacher self-efficacy, personal teaching efficacy and such (Coladarci & Donaldson, 1991). Self-efficacy is a concept that is based on the wealth of experience of a person (Okutan & Kahveci, 2012; Ozerkan, 2007). The individual's self-efficacy perception is of great importance in developing personal motivation and effective in decision-making (Usher & Pajares, 2008). Teacher self-efficacy refers to the perceptions of teachers about their capacities in achieving the goals previously set in teaching (Ruble, Usher, & McGrew, 2011). There are many factors that affect teachers' self-efficacy. These factors include the teacher's sense of personal accomplishment, sense of professional satisfaction, sense of commitment (Zee & Koomen 2010), and nature of a teacher's field knowledge (Egyed & Short, 2006; Marri, Ahn, Fletcher, Heng, & Hatch, 2012). In light of these considerations, teacher self-efficacy can make positive changes in classroom management.

Bases on researchers' experience, the concepts related to school and teaching were defined in 6 dimensions to identify better and find solutions to these problems experienced by teachers. These dimensions are (i) the role of the teacher, (ii) the role of the student (iii) the role of the family (iv) the school management, (v) the physical conditions, and (vi) the classroom management. It is thought that these problems mostly focus on teaching role and classroom management. Based on these considerations, there is a need for activities to develop pre-service teachers' self-efficacy and classroom management skills so they can easily adapt to more qualified, combative and social changes.

Today, movies have become a part of the lives of individuals. The manipulative effect of movies on human behavior is a known fact. Movies are known to cause profound emotional effects in humans. These influences can be thought to be caused by some of the striking scenes in the movies, movie music, or actors (Berk, 2009). Teachers, especially in the first years of their teaching profession have great difficulties and troubles because of lack of experience (Kaskaya, Unlu, Akar, & Ozturan, 2011). In this manner, teacher training programs should provide diverse opportunities for pre-

service teachers. Movies can provide a context for some sample cases and how to behave when the teachers faced similar situations. Using movies as a context might give the advantage of perceptions of relevance and psychological effects (Choi, & Song, 1996; Elmas & Eryilmaz, 2015).

The first significant work to produce audio-visual training tools by the Ministry of Education was in 1951. In order to replicate the tutorial and educational movies in Turkey, the Movie Center was established. However, using training movies has been limited to representations made without a scientific perspective, in Turkey (Yakar, 2013). Movies are now used in many areas for students' education (Yildirim, Koklukaya, & Selvi, 2015). One of these is the studies aimed at providing moral education through important stories and events described in the movies (Carr, 2006). Taking into consideration the developmental level of the students, it is important for teachers to examine and select the movies he/she will use in the classroom (Akbas, Canoglu, & Ceylan, 2015; Yakar, 2013). In recent years, many studies related to movies have been done. Pekdag (2010) studied the role of using chemistry-themed movies in chemistry education. To do this, chemistry-themed movies have been determined to increase students' interest in chemistry. It is important that movies promote professional development and should be used in pieces of training for similar positive effects (Blasco, Moreto, Blasko, Levites, & Janaudis, 2015). Studies have been conducted on how to effectively use movies in education (Michel & Roebbers, 2008; Michel, Roebbers, & Schneider, 2007). Examples of the use of movies related to pre-service teachers are also available (Güven Yildirim, 2015). The study by Kaskaya, Unlu, Akar and Ozturan (2011) indicate that movies lead to a significant change in the professional attitudes and self-efficacy of pre-service teachers. Similarly, in a study by Polat and Akcan (2017), education-themed movies were examined in terms of multicultural education. According to the results of this study, it was stated that some multicultural indicators (Statement of principles, school employees, the attitude of school employees, curriculum, teaching strategies, and materials) were reached. The following questions were generated to find answers in the study:

1. What is the effect of education-themed movies training on teacher efficacy?
2. What is the effect of education-themed movies training on science teaching efficacy?
3. How is the position of pre-service teachers between student-centered or teacher-centered approaches?

Method

Research Design

In this study, one-group pretest-posttest design was used (Fraenkel, Wallen, & Hyun, 2011). It is important to ensure internal validity in every research. Internal validity is the result of a causal relationship with the variables in the study (Karasar, 2004). Therefore, in this study some measures were taken: (i) 7-week period was determined for the effect to occur; (ii) The same measurement tools were applied as pre-test and post-test; (iii) All students participated in the 7-week training, so that the measurement tools were applied to the same group as pre-test and post-test; (iv) Voluntary participation of students was encouraged so there was no participant loss and

absenteeism. On the other hand, due to the absence of the control group in the design, it is difficult to argue that the difference between pre-test and post-test is only due to the training process. This is the limitation of this design.

Sample

The sample consists of a total of 60 students at each grade level (from first through fourth grades) who are studying at the department of science education at the faculty of education in an Anatolian university in the second half of 2016-2017. A pilot study was conducted for seven weeks in April and May 2016 (a year ago) so the students who had not participated in the pilot study enrolled the training.

Instruments

Teachers' Sense of Efficacy Scale (TSES): The scale was originally developed by Tschannen-Moran and Hoy (2001) and adapted to Turkish by Capa, Cakiroglu, and Sarikaya (2005). The scale used in the study consists of 24 items and three factors. The first factor, Self-Efficacy for Students Engagement, consists of 8 items; the second factor, Efficacy for Instructional Strategies, consists of 8 items; and the third factor, Efficacy for Classroom Management, consists of 8 items. The reliability of the scale was 0.82 for the first factor, 0.86 for the second factor and 0.84 for the third factor, and 0.93 for the overall scale. In the present study, these values were 0.83, 0.86, 0.52 and 0.85, respectively for the factors.

The Science Teaching Efficacy Belief Instrument (STEBI): The scale was initially developed by Enochs and Riggs (1990) and adapted to Turkish by Tekkaya, Cakiroglu, and Ozkan, (2002). The scale used in the study consists of 23 items and two factors. The first factor, Personal Science Teaching Efficacy Beliefs (PSTEB), consists of 13 items and the second factor, Personal Science Teaching Outcome Expectancy Scale (PSTOES) consists of 10 items. The reliability of the scale was 0.86 for the first factor and 0.79 for the second factor (Tekkaya, Cakiroglu, & Ozkan, 2002). In the present study, these values were 0.67 for the first factor, 0.54 for the second factor and 0.78 for the whole scale. Low reliability values are thought to be due to the small sample size.

Draw-A-Science-Teacher-Test-Checklist (DASTT-C): The test was initially been adapted from the "Draw a Scientist Test (DAST)," which is used to explore students' perceptions and images about scientists (Chambers, 1983). Finson, Beaver, and Crammond (1995) revised DAST as DAST-C. DAST-C was later developed into the Draw-A-Science-Teacher-Test-Checklist (DASTT-C) to determine the teaching style of teachers and students (Thomas & Pedersen, 1998; Thomas, Pedersen, & Finson, 2001). Many researchers have used DASTT-C to explore the opinions of pre-service teachers and students on teaching (Akkus, 2013; Buldur, 2017; Duban, 2013; Elmas, Demirdogen, & Geban, 2011; Tatar, 2015; Yilmaz, Turkmen, Pederson & Huyuguzel-Cavas, 2007). In this study, DASTT-C was used as a data collection tool. The students were asked in DASTT-C to "draw their pictures as a science teacher at school" and briefly explain the drawings, and to answer the questions "what the teacher did" and "what the student did."

Training Process

This study includes a seven-week training process. In the first and last weeks, pre and post-tests were done. In the remaining five weeks, all pre-service teachers were asked to watch the predetermined movie for the training each week. After the movie had been watched, pre-service teachers attended 2-hour-training, each week. The movies selected within the scope of this study were determined through a site that made movie trailers and promotions on the Internet. 3 researchers held 2 separate meetings to identify the films. In the first meeting, different films were scanned by the researchers and especially the films in which the teacher played an active role were determined. In 2 meetings, 10 of the 15 films identified in the previous meeting were eliminated and 5 films were decided to be used in the seven-week training process. In addition to the active role of the teacher, films with high interaction with family, school and school management were the main reasons for the selection of the 5 movies. One of the movies selected in the previous year's pilot study was changed because in the pilot study, 5 films were tried with a different group, and one film was replaced by a different film because of the feedback received from the pilot group. Since the pilot study was conducted with a different group of students 1 year ago, 5 movies were included in the training. Finally, the following movies were used: (Table 1).

Table 1

Training Process

Pre-test	Application/Training movies	Post-test
1. Teachers' Sense of Efficacy Scale (TSES)	1. Dead Poets Society, 1989	1. Teachers' Sense of Efficacy Scale (TSES)
2. The Science Teaching Efficacy Belief Instrument (STEBI)	2. Like Stars on Earth, 2007	2. The Science Teaching Efficacy Belief Instrument (STEBI)
3. Draw-A-Science-Teacher-Test-Checklist (DASTT-C)	3. October Sky, 1999	3. Draw-A-Science-Teacher-Test-Checklist (DASTT-C)
	4. 3 Idiots, 2009	
	5. İmkânsız Olasılık (2016)	

During the training process, for each week a trainer was determined to conduct the course. In this training, the content that is especially emphasized about the movies during the courses is given in the table below (Table 2). During the courses, questionnaire and discussion methods were used. The movies were discussed and evaluated by pre-service teachers in terms of six basic dimensions of education, every week. These dimensions were (a) the role of the teacher, (b) the role of the student, (c) the role of the family, (d) the role of school management, (e) physical conditions and (f) the classroom climate (atmosphere and management). Together with a researcher who conducted the course, a second researcher participated in supporting education and observing the process. Trainers and observers were coded as T1, T2, T3 and O1, O2 and O3.

Table 2
Training Program Application Process

Movies	Content	Trainer	Observer
Dead Poets Society, 1989	<ul style="list-style-type: none"> -The conservative attitude of the school administration, teachers and families -The extraordinarily disciplined and prescriptive school environment -The unusual struggle of the new teacher against the status quo, -Students are affected by the new teacher, -Students discover their potential, -Students begin to change, they are emancipated and the costs they pay as a result. 	T1	O1
Like Stars on Earth, 2007	<ul style="list-style-type: none"> -School life of a student with learning disabilities -Teachers and family who are not aware of learning difficulties -Student's school change -Arts teacher's great awareness of the student's problem and his struggle. -Arts teacher's realization of student's potential -Student's self-realization through the teacher 	T1	O1
October Sky, 1999	<ul style="list-style-type: none"> -Supporting and motivating role of the teacher -The work of the student to make his rocket with perseverance -The supportive attitude of the mother; and the father's prohibitive role -The school management's supporting position -The changes in the physical conditions of the class within years -Non-supporting class climate 	T2	O2
3 Idiots, 2009	<ul style="list-style-type: none"> -Teachers being authoritarian, traditional and stereotyped -Competitive student training -Unlike the class, some students use reasoning, questioning, curiosity and high-level thinking skills. -Teacher-centered classrooms -The traditional understanding of school management 	T3	O3
Imkansiz Olasilik (2016)	<ul style="list-style-type: none"> -The traditional understanding of school management -Open-ended exams that measure superior skills -The combative, self-confident, problem-solving, sensible, curious students -A flexible, participatory and extraordinary teacher -Student-centered classroom -Vulnerable school climate 	T3	O3

Pre-service science teachers had the opportunity to analyze and evaluate the movies from the above list within the mentioned six dimensions. They received a total of 10 hours of training throughout the research.

Analysis of Data

Teacher's Sense of Efficacy Scale (TSES) and The Science Teaching Efficacy Belief Instrument (STEBI): In the quantitative analysis, SPSS software was used to analyze the data. The data related to TSES and STEBI scales show that the data was normally distributed and Dependent groups t-test was applied to the pre-test and post-test scores of the Teacher's Sense of Efficacy Scale (TSES) and the Science Teaching Efficacy Belief Instrument (STEBI).

Draw A Science Teacher Test-Checklist (DASTT-C): Draw A Science Teacher Test-Checklist (DASTT-C) was used with its scoring sheet, and according to the scoring value, students' appreciation of student-centered/teacher-centered educational dimensions was determined.

Findings

Findings of Teacher's Sense of Efficacy Scale (TSES) and The Science Teaching Efficacy Belief Instrument (STEBI): Normality Test of the Data: Since the sample size was higher than 50, the Kolmogorov-Smirnov normality test was performed, and the data were found to be normal. The p (sig) value greater than 0.05 which means that the normality of the data was provided. The values of skewness and kurtosis are each divided into standart error and these values were between -1.96 and 1.96. According to Can (2014) if the values are between -1.96 and 1.96, the data shows normal distribution. In Table 3, t-test results of dependent groups are given for pre-test and post-test scores of pre-service teachers for self-efficacy and teacher self-efficacy for science teaching.

Table 3

The t-test Results of Science Teaching Efficacy Belief and Teacher's Sense of Efficacy for Pre-Test and Post-Test scores of Pre-Service Science Teachers

Scales	Groups	N	Average	SD	t	p	Significance
The Science Teaching Efficacy Belief	Pre-test	60	78.45	7.92	-5.114	0.000*	Post-test; pre-test
	Post-test	60	83.35	9.04			
Teacher's Sense of Efficacy	Pre-test	60	160.10	22.61	-3.107	0.003*	Post-test; pre-test
	Post-test	60	167.38	17.95			

* $p < 0.01$

When Table 3 is examined, it is seen that there is a significant difference between teachers' self-efficacy and teacher self-efficacy pre-test and post-test scores for science teaching in favor of post-test scores.

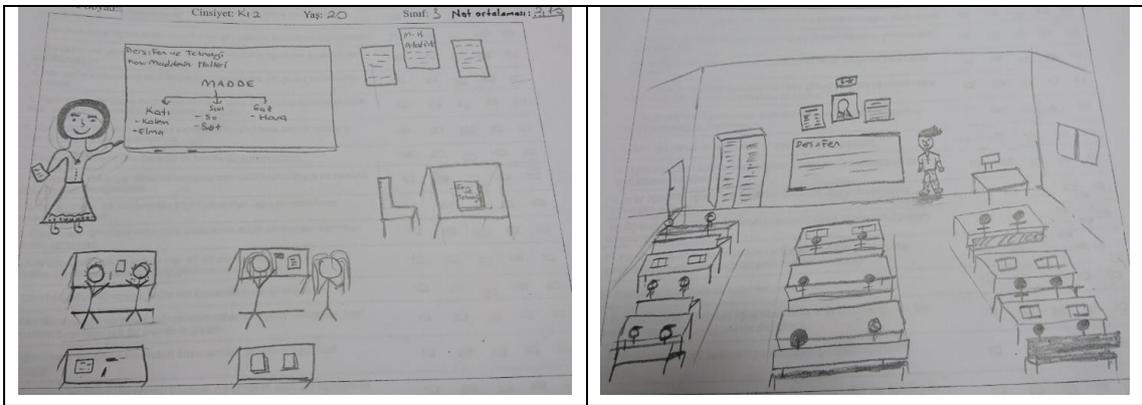
Findings of Draw A Science Teacher Test-Checklist (DASTT-C): According to the results of DASTT-C, it is observed that the pre-service teachers shift towards a more student-centered education approach (Table 4). In the beginning, 13 pre-service teachers made a student-centered drawing, and as a result of the training program, this number increased from 13 to 24 and increased by 11 people. Also, there were 23 pre-service teachers in the mixed model, and this number rose to 24 by the end of the training.

Table 4

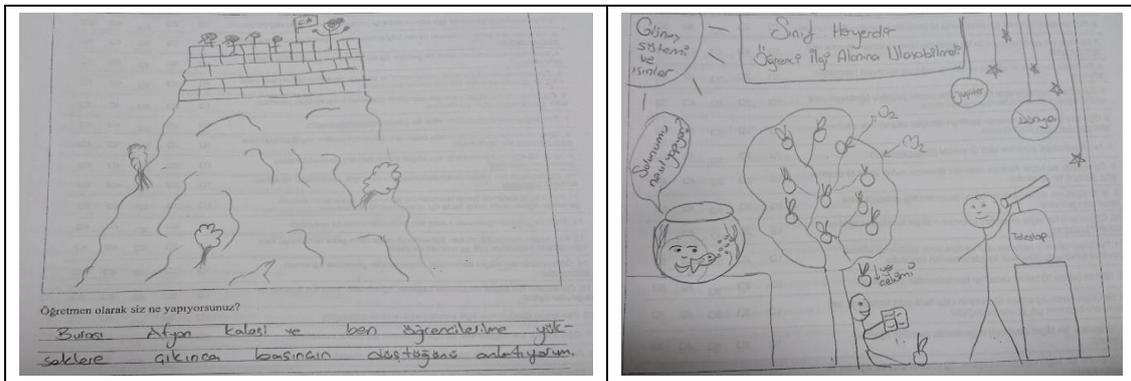
Results of Draw A Science Teacher Test-Checklist

Type	Pre-test	Post-test
Student-centered	13	24
Mixed model	23	24
Teacher-centered	24	12
Total	60	60

Two teacher-centered drawings are shown below. The transition from teacher-centered course-handling to student-centered course-handling style is a challenging process that requires awareness (Figure 1).

Figure 1. Examples of Teacher-Centered Drawings

While the number of pre-service teachers with a student-centered approach was 13 in the first drawings, this number rose to 24 after the training. According to qualitative analysis results, the transition of 11 pre-service teachers to student-centered understanding represents a 30 percent increase in proportion. The qualitative evidence presented that the education given to the students is also valid for developing their instructional style including more figures from student-centered teaching. Two student-centered pre-service teacher drawings are provided below (Figure 2).

Figure 2. Student-Centered Drawing Examples

As can be seen in the drawings, student-centered understanding requires more flexible and creative individuals. In informal interviews with students, it is determined

that they have an idea about how they should meet with student-centered educational examples throughout their education and how student-centered education should be done.

Discussion and Conclusions

The self-efficacy beliefs of pre-service teachers constitute the basis of the perception of success when they start the teaching profession (Henson, 2001). Using movies as an instructional tool is useful in the development of self-efficacy beliefs of pre-service teachers (Kaskaya, Unlu, Akar, & Ozturan, 2011; Lafferty, 2016). Movies can support learning if used to reflect school life (Grant, 2002). Consequently, it may well be argued that movies have a huge role in shaping up the society (Yurdigül, 2014). This study pinpoints that teacher and school themed movies are powerful tools that can be used to reveal the potential of pre-service teachers' self-efficacy. Results indicated that self-efficacy perceptions of pre-service teachers reached a better level after the training. Although pre-service teachers' self-efficacy perceptions were found to be at a reasonable level, a statistically significant difference in favor of the last test suggests that a short-term education can also increase the positive perception to a better level. The fact that the interest of the pre-service teachers and their expectations about the training was observed at a high level throughout the study supports this finding. Today, movies are becoming an essential component of educating students with uplifted self-efficacy. Yaman, Koray, and Altuncekic (2004) point out that the efficacy of pre-service teachers should reach a high level at faculties. Kiremit and Gokler (2010) state that the high level of efficacy beliefs of the pre-service teachers is of great importance both for personal development and for future students. Askar and Umay (2001) draw attention to the importance of educating individuals with high self-efficacy. Individuals with high self-efficacy perception are determined, challenging, patient and success-oriented individuals. Hoy and Spero (2005) argue that self-efficacy perception is related to the classroom management skills of teachers and this is necessary for a qualified class climate. According to Coban and Sanalan (2002), self-efficacy perception increases the future teaching performance of pre-service teachers. For this purpose, it is of great importance to conduct studies to improve the self-efficacy of the pre-service teachers. Ekici (2008) states that pre-service teachers who have self-efficacy can take on essential tasks in the development of the country.

This study also showed that pre-service science teachers' science teaching efficacy beliefs increased to a better level. This meant given training helped reinforce science teaching efficacy as well as the sense of efficacy. Bikmaz (2002) states that it is of great importance to identify candidates who have low science teaching efficacy before starting teaching profession. Because teachers who conduct science courses in schools are expected to have a high level of science self-efficacy (Kucuk, Altin, & Palic, 2013), it is clear that teacher training institutions should play an active role in the creation of teaching environments where pre-service teachers can demonstrate their competencies. These institutions should also provide competencies in the subject of science (Morgil, Secken, & Yucel, 2004; Yildirim, Koklukaya, & Selvi, 2015).

The findings of the draw a science teacher test-checklist revealed that the pre-service teachers developed from a teacher-centered approach towards a student-centered education approach after the training. Before the training, only 13 pre-service teachers made a student-centered drawing, and after the end of the training, 24 pre-service

teachers made a student-centered drawing. The increase in student-centered drawings is promising for the change in the perceptions of pre-service teachers about the future. This change in the perceptions will lead to a student-centered attitude of pre-service science teachers in future learning environments. Doymus, Simsek, and Bayrakceken (2004) state that student-centered training plays a critical role in increasing academic achievement and in students' positive attitudes towards courses. Pre-service science teachers' student-centered attitude towards their future students can both increase academic achievement and increase interest in science.

In conclusion, study findings showed that movies are essential tools to support pre-service teacher training. For this reason, the use of movies in pre-service teacher education programs can support teacher efficacy and science teaching efficacy. The study indicates that it may only be possible to create a student-centered approach by raising awareness. Consequently, school-themed movies used in this study have been observed to have an impact. Therefore, activities which enhance teacher efficacy and science teaching efficacy should be included in the curricula of faculties of education. In particular, increasing the quality of pre-service teachers' teaching practices and providing appropriate feedback can produce useful results. Moreover, similar training for pre-service teachers will provide positive contributions to our education system.

Limitations

The duration of the study was short. Therefore, this may mean that the effect may be temporary. Generally, it is recommended to perform more extended periods for permanent attitude changes. Despite this, the generally favorable situation determined by the observation in the students revealed the necessity to report the findings. Also, both qualitative and quantitative data were collected. After a certain period, it may be beneficial for the same students to be re-measured and looked at the permanence of the change, but the possibilities and limitations in the scope of this project caused the process to be reported in this way.

References

- Acıkgöz, K. U., Ozkal, N., & Kilic, A. G. (2003). Öğretmen adaylarının sınıf atmosferine ilişkin algıları. *Hacettepe University Journal of Education*, 25, 1-7.
- Akbas, O., Canoglu, S. N., & Ceylan, M. (2015). Eğitsel kısa film ve videoları yeniden düşünmek: Eğitsel kısa film ve video yarışmasına ilişkin bir değerlendirme. *Journal of Theoretical Educational Science*, 8(2), 282-296.
- Akkus, H. (2013). Pre-service secondary science teachers' images about themselves as science teachers. *Journal of Baltic Science Education*, 12(2), 249-260.
- Alderman, G. L., & Green, S. K. (2011). Social powers and effective classroom management: enhancing teacher-student relationships. *Intervention in School and Clinic*, 47(1), 39-44.
- Askar, P., & Umay, A. (2001). İlköğretim matematik öğretmenliği öğrencilerinin bilgisayarla ilgili öz-yeterlik algısı. *Hacettepe University Journal of Education*, 21, 1-8.
- Berk, R. A. (2009). Multimedia teaching with video clips: TV, movies, youtube, and mtvu in the college classroom. *International Journal of Technology in Teaching & Learning*, 5(1), 1-21.
- Bikmaz, F. H. (2002). Fen öğretiminde öz-yeterlik inancı ölçeği. *Educational Sciences & Practice*, 1(2), 197-210.
- Blackbourn, J. M., Fillingim, J., Kritsonis, M. A., Campbell, J., Rader, D., Schillinger, D., & Ray, J. (2007). The road ahead: Ten trends that will impact education in this century. *National Forum of Educational Administration and Supervision Journal*, 24(3), 4-22.
- Blasco, P. G., Moreto, G. Blasko, M. G., Levites, M. R., & Janaudis, M. A. (2015). Education through Movies: Improving teaching skills and fostering reflection among students and teachers. *Journal for Learning through the Arts*, 11(1), 1-16.
- Buldur, S. (2017). A longitudinal investigation of the preservice science teachers' beliefs about science teaching during a science teacher training programme. *International Journal of Science Education*, 39(1), 1-19.
- Can, A. (2014). *SPSS ile bilimsel araştırma sürecinde nicel veri analizi*. Ankara: Pegem Akademi.
- Capa, Y., Cakiroglu, J., & Sarikaya, H. (2005). The development and validation of a Turkish version of teachers' sense of efficacy scale. *Education and Science*, 30(137), 74-81.
- Carr, W. (2006). Philosophy, methodology and action research. *Journal of Philosophy of Education*, 40(4), 421-435.
- Chambers, D. W. (1983). Stereotypic images of the scientist: The Draw a Scientist Test. *Science Education*, 67(2), 255-265.
- Choi, J. S., & Song, J. (1996). Students' preferences for different contexts for learning science. *Research in Science Education*, 26(3), 341-352.
- Coban, A., & Sanalan, V. A. (2002). Fen bilgisi öğretimi dersinde özgün deney tasarım sürecinin öğretmen adayının öz yeterlilik algısına etkisi. *Erzincan University Journal of Education Faculty*, 4(2), 1-10.

- Coladarci, T., & Donaldson Jr, G. A. (1991). School climate assessment encourages collaboration. *NASSP Bulletin*, 75(536), 111-119.
- Doymus, K., Simsek, U., & Bayrakceken, S. (2004). İşbirlikçi öğrenme yönteminin fen bilgisi dersinde akademik başarı ve tutuma etkisi. *Journal of Turkish Science Education*, 1(2), 103-115.
- Duban, N. Y. (2013). Pre-service science and technology teachers' mental images of science teaching. *Eurasian Journal of Educational Research*, 50, 107-126.
- Egyed, C. J., & Short, R. J. (2006). Teacher self-efficacy, burnout, experience and decision to refer a disruptive student. *School Psychology International*, 27(4), 462-474.
- Ekici, G. (2008). Sınıf yönetimi dersinin öğretmen adaylarının öğretmen öz-yeterlik algı düzeyine etkisi. *Hacettepe University Journal of Education*, 35, 98-110.
- Elmas, R., Demirdogen, B., & Geban, O. (2011). Preservice chemistry teachers' images about science teaching in their future classrooms. *Hacettepe University Journal of Education*, 40, 164-175.
- Elmas, R., & Eryilmaz, A. (2015). How to write good quality contextual science questions: criteria and myths. *Journal of Theoretical Educational Science*, 8(4), 564-580.
- Enochs, L. G., & Riggs, I. M. (1990). Further development of an elementary science teaching efficacy belief instrument: A preservice elementary scale. *School Science and Mathematics*, 90(8), 694-706.
- Evertson, C. M., Emmer, E. T., Sanford, J. P., & Clements, B. S. (1983). Improving classroom management: An experiment in elementary school classrooms. *The Elementary School Journal*, 84(2), 173-188.
- Finson, K. D., Beaver, J. B., & Cramond, B. L. (1995). Development and field test of a checklist for the Draw A Scientist Test. *School Science and Mathematics*, 95(4), 195-205.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. New York: McGraw-Hill Humanities/Social Sciences/Languages.
- Gable, R. A., Hester, P. H., Rock, M. L., & Hughes, K. G. (2009). Back to basics: Rules, praise, ignoring, and reprimands revisited. *Intervention in School and Clinic*, 44(4), 195-205.
- Grant, P. A. (2002). Using popular films to challenge preservice teachers' beliefs about teaching in urban schools. *Urban Education*, 37(1), 77-95.
- Guven Yildirim, E. (2015). Science Teacher Candidates' Portraits of Science Teaching as a Profession by Using the Characters in the Movie " 3 Idiots". *Educational Sciences: Theory and Practice*, 15(5), 1363-1372.
- Henson, R. K. (2001). *Relationships between preservice teachers' self-efficacy, task analysis, and classroom management beliefs*. Paper presented at the annual meeting of the Southwest Educational Research Association, New Orleans, LA.

- Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education*, 21(4), 343-356.
- Karasar, N. (2004). *Bilimsel araştırma yöntemi*. Ankara: Nobel Yayın Dağıtım.
- Karatas, K., Ardic, T., & Oral, B. (2017). Öğretmenlik mesleğinin yeterlikleri ve geleceği: Metaforik bir analiz. *Turkish Studies*, 12(33), 291-312.
- Kaskaya, A., Unlu, I., Akar, M. S., & Ozturan, M. S. (2011). The effect of school and teacher themed movies on pre-service teachers' professional attitudes and perceived self-efficacy. *Educational Sciences: Theory & Practice*, 11(4), 1778-1783.
- Kiremit, H. O., & Gokler, İ. (2010). Fen bilgisi öğretmenliği öğrencilerinin biyoloji öğretimi ile ilgili öz-yeterlik inançlarının karşılaştırılması. *Pamukkale University Journal of Education*, 27, 41-54.
- Kucuk, M., Altun, E., & Palic, G. (2013). Sınıf öğretmenlerinin fen öğretimi öz-yeterlik inançlarının incelenmesi: Rize ili örnekleme. *Amasya Education Journal*, 2(1), 45-70.
- Lafferty, G. (2016). Opening the learning process: The potential role of feature film in teaching employment relations. *Australian Journal of Adult Learning*, 56(1), 8-28.
- Marri, A. R., Ahn, M., Fletcher, J., Heng, T. T., & Hatch, T. (2012). Self-efficacy of US high school teachers teaching the federal budget, national debt and budget deficit: a mixed-methods case study. *Citizenship, Social and Economics Education*, 11(2), 105-120.
- Michel, E., & Roebbers, C. M. (2008). Children's knowledge acquisition through film: Influence of programme characteristics. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, 22(9), 1228-1244.
- Michel, E., Roebbers, C. M., & Schneider, W. (2007). Educational films in the classroom: Increasing the benefit. *Learning and Instruction*, 17(2), 172-183.
- Morgil, İ., Secken, N., & Yucel, A. S. (2004). Kimya öğretmen adaylarının öz-yeterlik inançlarının bazı değişkenler açısından incelenmesi. *Journal of Balikesir University Institute of Science and Technology*, 6(1), 62-72.
- Okutan, M., & Kahveci, A. (2012). İlköğretim okul müdürlerinin genel öz yeterlik inançlarının çeşitli değişkenler açısından incelenmesi (Rize örneği). *Kastamonu Education Journal*, 20(1), 27-42.
- Ozerkan, E. (2007). *Öğretmenlerin öz-yeterlik alguları ile öğrencilerin sosyal bilgiler benlik kavramları arasındaki ilişki* (Master's thesis). Sosyal Bilimler Enstitüsü. Trakya Üniversitesi.
- Pekdag, B. (2010). Alternative methods in learning chemistry: Learning with animation, simulation, video and multimedia. *Journal of Turkish Science Education*, 7(2), 111-118.
- Polat, S., & Akcan, E. (2017). Eğitim temalı filmlerin çokkültürlü eğitim açısından analizi. *Turkish Studies*, 12(18), 475-504.
- Roberts, J. K., & Henson, R. K. (2001). A confirmatory factor analysis of a new measure of teacher efficacy: Ohio State Teacher Efficacy Scale. Paper presented at the annual meeting of the American Educational Research Association, Seattle.

- (ERIC Number: ED453254), retrieved from <https://files.eric.ed.gov/fulltext/ED453254.pdf>.
- Ruble, L. A., Usher, E. L., & McGrew, J. H. (2011). Preliminary investigation of the sources of self-efficacy among teachers of students with autism. *Focus on Autism and Other Developmental Disabilities, 26*(2), 67-74.
- Sahin, M., & Ozbay, Y. (1999). Üniversite öğrencilerinin empatik sınıf atmosferine ilişkin algılamaları. *Hacettepe University Journal of Education, 15*, 74-83.
- Savran, A., & Cakiroglu, J. (2003). Differences between elementary and secondary preservice science teachers' perceived efficacy beliefs and their classroom management beliefs. *Turkish Online Journal of Educational Technology, 2*(4), 15-20.
- Shechtman, Z., & Leichtenritt, J. (2004). Affective teaching: a method to enhance classroom management. *European Journal of Teacher Education, 27*(3), 323-333.
- Tatar, N. (2015). Pre-service teachers' beliefs about the image of a science teacher and science teaching. *Journal of Baltic Science Education, 14*(1), 34-44.
- Tekkaya, C., Cakiroglu, J., & Ozkan, O. (2002). A case study on science teacher trainees. *Education and Science, 27*(126), 15-21.
- Thomas, J. A., & Pedersen, J. (1998). Draw-A-Science-Teacher-Test: A visualization of beliefs and self-efficacy. Paper presented in *the Annual Meeting of Association for Science Teacher Education*, Minneapolis.
- Thomas, J. A., Pedersen, J. E., & Finson, K. (2001). Validating the Draw-A-Science-Teacher-Test-Checklist (DASTT-C): Exploring mental models and teacher beliefs. *Journal of Science Teacher Education, 12*(4), 295- 310.
- Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783-805.
- Turnuklu, A., & Yildiz, V. (2002). Öğretmenlerin öğrencilerin istenmeyen davranışlarıyla başa çıkma stratejileri. *The Journal of Contemporary Education, 284*, 22-27.
- Usher, E. L., & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research, 78*(4), 751-796.
- Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology, 82*(1), 81-91.
- Woolfolk, A. E., Rosoff, B. & Hoy, W. K. (1990). Teacher's sense of efficacy and their beliefs about managing students. *Teaching and Teacher Education, 6*(2), 137-148.
- Yakar, H. G. I. (2013). Sinema filmlerinin eğitim amaçlı kullanımı: Tarihsel bir değerlendirme. *HAYEF Journal of Education, 10*(1), 21-36.
- Yaman, S., Koray, O. C., & Altunçekic, A. (2004). Fen bilgisi öğretmen adaylarının öz-yeterlik inanç düzeylerinin incelenmesi üzerine bir araştırma. *The Journal of Turkish Educational Sciences, 2*(3), 355-364.
- Yildirim, E. G., & Koklukaya, A. N. (2017). Öğretmenlik mesleğine yönelik hazırbulunuşluk ölçeğinin geliştirilmesi ve fen bilgisi öğretmen adaylarının

- hazırbulunuşluk düzeylerinin belirlenmesi. *International Journal of Social Science*, 56, 67-82.
- Yildirim, E. G., Koklukaya, A. N., & Selvi, M. (2015). Öğretim materyali olarak 3-Idiot filmi ile öğretmen adaylarının günlük hayatta fenin kullanımı ve eğitimde aile rolü üzerine görüşlerinin belirlenmesi. *Trakya University Journal of Education*, 5(2), 94-105.
- Yilmaz, H., Turkmen, H., Pedersen, J. E., & Huyuguzel-Cavas, P. (2007). Evaluation of pre-service teachers' images of science teaching in Turkey. *Asia-Pacific Forum on Science Learning and Teaching*, 8(1), 1-20.
- Yurdigul, A. (2014). Eğitim olgusunun sinematografik anlatıdaki yeri üzerine bir yaklaşım denemesi: Bal filmi örneği. *Ekev Akademi Dergisi*, 60, 487-502.
- Zee, M., & Koomen, H. M. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research*, 86(4), 981-1015.



This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0). For further information, you can refer to <https://creativecommons.org/licenses/by-nc-sa/4.0/>