JOURNAL OF BALTIC SCIENCE EDUCATION

ISSN 1648-3898

THE DETERMINATION OF OPINIONS OF PRE-SERVICE SCIENCE TEACHERS ON THE CURRICULUM OF SCIENCE COURSES ON THE BASIS OF THE 3-IDIOTS MOVIE

Ayşe Nesibe Köklükaya

Abstract. *Science teaching emerged due to an attempt to understand the world around us and a sense of wonder at nature and survived until today by means of being supported by new research and findings. The implementation of science in schools is carried out with curriculums. The main purpose of the curriculum of science courses is to train all students in science literacy regardless of their individual differences. According to the educational program of sciences courses, audiovisual aids used in education with a learning objective which is one of these aids is one of the most effective ways to ensure permanent learning. Within this concept the purpose of the study is to determine the opinions of pre-service science teachers about the curriculum of the science lesson based upon the stories in the 3-Idiots movie. In this research, phenomenology research was used. As a data gathering tool, three semi-structured interview questions prepared accordingly to "3- Idiots" movie were used. According to the participants, the science curriculum must be lead in investigating, interrogating, criticising, curiosity and reconnoitering in terms of features that must be acquired for being scientifically literate individuals.*

Key words: *Pre-service science teachers' perceptions, science, science curriculum, 3-idiots movie.*

Ayşe Nesibe Köklükaya
Gazi University, Turkey

Introduction

Science teaching emerged with an effort to understand it by wondering the nature and survived until today by means of being supported with new searches and findings. The purpose of science teaching is to transmit the present basic laws and functioning of the natural world that we live in to the students (Arslan, 2005). According to Çağlar, Gürdal and Şahin (1997) science is described as a process of exploration, testing and separating and integrating of the regular functioning of the natural world, of the individual within new connections with a planned and purposeful study and as an alliance of information in this way.

Nowadays, the known thing, the changes and innovations that occurred in the physical science curriculum have contributed to the improvement of countries and have increased the welfare level of people who live in these countries. This case increases the importance of physical sciences and physical education every passing day and all nations attach importance to the improvement of physical sciences (Ayas, Çepni & Akdeniz, 1993; Bağcı-Kılıç, 2002). The implementation of science in schools is carried out with curriculums. Developing the Erden program (1995) is defined as a process of design, implementation, evaluation and rearranging as a result of the evaluation of educational programs. At the present time, in schools, education is carried out in line with the science education programs revised in 2013. The main purpose of the educational programs of science courses is to train all students to be science literate, regardless of their individual differences. For this purpose, the features that should be earned by the individuals are the following: the science literate individual should be rogatory, a problem-solver, self-confident, open to cooperation, a lifelong learner with sustainable development awareness, he/she should establish an impressive communication, should have knowledge, skills, a positive attitude, perception and valuation

in regard to physical sciences, and should possess apprehension in relation to the relationship of physical sciences with technology, community-environment and psychomotor skills. In an attempt to train the individuals having the aforementioned skills, physical science courses selected a learning approach that is based on examination-questioning as a baseline for the educational program (MEB, 2013a). While Ketehult and Dede (2006) specified that the learning expected to take place in science education needed to be by means of questioning, Haury (1993) explained that the only word to be chosen to define the purposes of science teaching should be 'questioning'. Besides the fact that the basis of the querier learning strategy dates back to the 1960s, it is also known that it was affected considerably by the opinions of John Dewey (Ediger, 2001). Querer learning strategy was signified in the garb of asking questions, searching, creating, discussing and reflecting. Keselman (1993) described querer-investigative learning as an educational activity in which students obtain information about the world they live in from the scientist's position and said that students became skillful in carrying on their own research, formulating all of the hypothesizes of a scientific research, designing experiments and testing them, collecting data and reporting the results. According to Evans (2001), physical sciences ensure that students observe like a scientist by means of versatile and purposeful experiments, to ask questions, to plan and carry out the investigation, to collect and analyze data, to interpret the findings and to produce solution proposals to the problems they come across. Thus, by ensuring the development of the students' skills that can be necessary for them in the course of their whole life, it helps them to cope with the problems they come across during the course of their life (Smith, Blakeslee & Anderson, 1993; Branch & Solowan, 2003).

According to the physical science curriculum based on examination-questioning strategy, learning atmospheres where students play an active role and teachers play a directional and guiding role in the application and planning of the course were selected as baselines (MEB, 2013a). In addition, it was emphasized by Seferoğlu (2006) that the more the learning efficiency appeals to the sense organs, the more beneficent and permanent it becomes and that the omission will become less in parallel with this. Within this concept, an audiovisual aid used in education with a learning objective which is one of these aids is one of the most effective ways to ensure permanent learning (Seferoğlu, 2006).

A learning object is any digital source which is reusable to support learning (Wiley, 2002; Polsani, 2003, p. 77). According to South and Monson (2000), if it is a learning object, it includes a wide range of digital media starting from mind maps and graphs to video and interactive simulations which is designed or used to realize the aims of teaching. Educational movies are also one of the learning objectives which has been existent in learning environment for 50 years (Depover, Giardina & Marton, 1998). Besides, educational movies are one of the educational materials which are needed in an educational environment to achieve success in the learning-teaching process (Wenger, 1943). Those movies are prepared in order to provide information about a specific topic (Michel, Roebers & Schneider, 2007). Before getting into complicated subjects, it has been discovered that educational movies can be used as an "advance organizer" (Kreidler Carol, 1998; Michel, Roebers & Schneider, 2007; Musbikin, 2007), and popular science fiction movies contribute in students''making sense of scientific concepts and formation of mental schema (Barnett, Wagner, Gatling, Anderson, Houle & Kafka, 2006). Moreover, Öztaş (2008) suggested that pausing and discussing the movie while the subject matter is taught is an effective technique. Birkök (2008), on the other hand, states in his research that movies are effective in transferring comprehensive and intensive information to the masses. Furthermore, Whiteman (2009) indicates that documentaries can be used to reach the masses and teach the masses. However, researchers underline the precautions which need to be carried out to ensure that educational movies are used suitably for their purpose. Bruner (2008) implies that educational movies should be used correlatively with the other teaching methods and techniques; in addition, Küçükahmet (2008) says that not only educational movies, but also every kind of education tool should be used under the guidance of the teacher, not instead of his/ her place. On the other hand, Demircioğlu (2007) states that movies may have several limitations such as pacifying the students, being unsuitable for the students' level, and creating defective comments or prejudices.

According to McCormick (2007), in teacher training institutions or schools, it may be useful and effective to use movies embodied with school or teaching themes in establishing positive attitudes towards the teaching profession by setting an example for students. Through this study, pre-service science teachers were asked to watch one of the movies named 3-Idiots made in 2009 that is recommended by MEB (2013b) to be watched by students, and offer opinions on the curriculum of the science lesson based upon the stories in the 3-Idiots movie - this was the main purpose. Within this context, the problem of the research is "What are the views of pre-service science teachers on the science curriculum?

Research Focus

Movies are used by researchers in various fields. Barnett and others (2006) found that students who had watched a science-fiction movie had a lot of misconceptions about the nature of the Earth. Similarly, Efthimiou and Llewellyn (2004) have created a movie course in which students analyze movies using the scientific principles they were learning in physics class. On the other hand, many researchers have studied the 3-Idiot movie. Anwar (2012) examined the educational values in the 3 Idiots movie. Krisnawati (2011) studied the psychology of Raju's character in the movie. On the other hand, Herdindha and Riyanto (2014) studied parental pressure and how it has an impact on the children in 3 Idiots. And they indicated that the impact of the pressure makes students anxious. From this study it can be seen that movies may be used to reveal the perceptions about the topic. But there is no study in literature which uses this movie to learn more about the perceptions of pre-service science teachers' opinions about the curriculum. The movie has a well-structured curriculum sample with an interesting story. For this reason this study will contribute to the literature.

Methodology of Research

In this research, among other qualitative research types, phenomenology research was used to obtain data. During the process of research, the pre-service science teachers watched the movie '3 Idiots', on the basis of the stories and characters that played the role in this film, the present facts that pre-service science teachers have related to the subjects were examined. Phenomenology enables individuals to describe their conscious experiences related to a fact. Thus, the researcher can reach the life of the individual and facts that each of them formed based on their own experiences (Christensen, Johnson & Turner, 2011). In short, phenomenology examines how people explain the meaning of the experiences they go through, how they describe them, how they remember them, how they evaluate them and how they transmit them to other people (Patton, 2011). In this study, the researchers were concerned about the private experiences of the individuals and they examined the effect of the movie they watched on their personal ideas or their lives. For this purpose, negotiations were carried out with participants and the opinions of the participants concerning the subject were analyzed with a broad scope.

Participants

Participants whose input was collected are selected by purposeful sampling, which enables the researcher to pick individuals who will answer the problems of the research study (Cohen, Monion & Morrison, 2007). In this study, researchers selected the Gazi Faculty of Education as a study zone since it is easily accessible. Participants were chosen especially from amongst the pre-service science teachers who take the course named "Science Technology Programme and Planning". Research was carried out in this course over one week. Study groups consisted of two different kinds of participants. The first group included 83 pre-service science teachers who were studying Elementary Science Education at 2nd grade at the Gazi Faculty of Education in the 2012-2013 school years. The other study group consisted of 41 pre-service science teachers who were studying Elementary Science Education at 2nd grade at Gazi Faculty of Education in 2013-2014 the school years.

Data Collection Tools

As a data gathering tool, three semi-structured interview questions were prepared accordingly to the "3-Idiots" movie were used. The data, which relate to the aim of this study, are gathered through semi-structured interview techniques which provide certain and detailed descriptions related to the situation of pre-service science teachers (Punch, 2005). To accomplish this, an interview form was designed by researchers and the order of it was followed throughout the interviews. All the data collected from the interviews were transcribed and recorded in the electronic environment with the consent of the participants. Since pre-service science teachers' own names were used in the findings, each pre-service science teachers were given the names; F_1, F_2, F_3… for the first year pre-service science teachers and S_1, S_2, S_3,… for the second year pre-service science teachers.

Data Collection Process

Before starting the study, educational movies and sources on their usage in science education were scanned and analyzed carefully. Then, the movie called "3-Idiots" was decided upon for use in the study since it was appropriate for the purpose of the project. The study continued for two years; the spring terms of the 2012-2013 and the 2013-2014 school years. In both years, pre-service science teachers were asked to watch the "Three Idiots" in a classroom environment first. Then, the data collection process was completed by gathering the opinions of each pre-service science teachers by the researcher.

Analysis of Data

The steps indicated by Miles & Huberman (1994) and Yıldırım & Şimşek (2008) were followed in the analysis of the data. Content analysis, one of the qualitative data analysis methods, was chosen in order to analyze the data. The first step in qualitative data analysis was turning data into written documents. In the next step, a coding key was created to indicate on which themes the codes would be prepared and given. Then, coded expressions were turned into themes by rearranging them according to their similarities and differences. After the themes were created, tables were created which showed the theme, code and utterance frequency of the codes by students. The written documents transcribed from the interviews were analyzed with the qualitative analysis program called HyperRESEARCHTM 2.6.1.

Results of Research

To indicate the opinions of pre-service science teachers on the curriculum of the science lesson, pre-service science teachers are firstly asked to watch the "3-Idiots" movie. After the movie, three open-ended questions were directed to them in order to identify their opinions on the curriculum of the science lesson. In this section, data collected for each question are shown in a different table. In the first place, pre-service science teachers were asked to "Criticize the curriculum entreated in the movie" and Table 1 shows their responses.

Table 1. Frequency of pre-service science teachers' answers to first question.

Themes		Codes	Frequency
Positive aspects	Nonexistence	F3, F21,F17, F32, F35, F53, F65,F73, F78, F79, S31, S32, S33, S24, S27, S7, S8, S12, S24	19
	Self-disciplined	F31, F63, F67, F69, F76, F83, F23, F25, S33	9
	Practical	F30, F56, S37, S6, S8	5
	Awards to achievement	F12, F42, F66, S16, S33	5
	Project-based	F10, F31, F61, S34, S23	5
	Gains combativeness	F44, F47, F48, F74	4
	Competitive	S36, S1, S19, S22	4
	The system is better than nothing	F21, F22	2
	Equality	S30, S2	2
	Responsibility transmitter	S33, S39	2
Negative aspects	Rote-learning	F15, F16, F26, F7, F4, F3, F25, F20, F19, F10, F5, F21, F6, F12, F17, F22, F18, F23, F24, F14, F30, F31, F32, F34, F35, F36, F37, F38, F39, F40, F41, F42, F43, F44, F45, F46, F47, F48, F49, F50, F51, F52, F53, F54, F55, F56, F57, F60, F61, F62, F66, F67, F70, F71, F72, F73, F74, F75, F77, F79, F80, F82, F83, S26, S27, S29, S33, S35, S37, S38, S39, S40, S22, S32, S28, S30, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S15, S17, S19, S20, S21, S23, S24, S25	96
	Oppressive	F15, F16, F2, F4, F3, F10, F19, F18, F28, F31, F33, F35, F36, F38, F39, F40, F41, F46, F47, F49, F51, F52, F53, F55, F56, F57, F63, F66, F68, F74, F76, F78, S29, S40, S41, S2, S5, S8, S10, S11, S12, S15, S17, S20, S25	45

Negative aspects	Competitor	F16, F2, F3, F8, F10, F5, F21, F22, F18, F23, F27, F35, F39, F40, F41, F42, F43, F47, F48, F53, F55, F56, F59, F60, F63, F66, F71, F75, F79, S28, S29, S31, S34, S40, S6, S7, S9, S10, S11, S16, S18, S20, S39	43
	Theoretical/ not practical	F15, F6, F17, F23, F14, F45, F46, F52, F59, F66, F68, F71, F72, F79, F80, F81, S26, S27, S30, S31, S33, S21, S22, S25, S29, S4, S8, S21	28
	Worrisome	F16, F3, F8, F19, F18, F28, F44, F46, F51, F55, F66, S26, S27, S2, S9, S12, S15, S20	18
	Teacher centered instruction	F3, F9, F20, F11, F23, F24, F29, F31, F44, F57, F69, F70, F73, F81, S37, S41, S1	17
	Suppress the curiosity/ excitement	F7, F9, F11, F34, F35, F40, F41, F43, F46, F57, F60, F 66, F70, F71, F76	15
	Dispatch thinking	F16, F26, F9, F6, F31, F49, F52, F53, F72, S34, S40, S41	12
	Without communication	F20, S29, S33, S39, S26, S16, S17, S18, S19	9
	Disincentive creative thinking	F9, F10, F11, F6, F24, F37, F51, S8	8
	Offending teacher attitıde	F15, F3, F17, F47, F71, F82, S40	7
	Not consider of individual differences	F35, F39, F41, F66, F74, S37, S3	7
	Punishment based	F42, F64, F77, F78, S28, S41	6
	Non- innovator	F28, F32, F44, F76, S17	5
	Not intended of necessity	F13, F15, F49, S40, S34	5
	Non-interrogator	F26, F38, F52, F66, F70	5
	Passive student	F29, F73, F81, F37, S33	5
	Based on classical methods	F29, S29, S38, S6, S11	5
	Research blocker	F9, F11, F35, F41, F66	5
	Discussion blocker	F18, F72	2
	Not incite critical thinking	F26, F6	2
	Intensive	F13	1

The educational programme in the movie was criticized under two themes on the condition that both positive and negative aspects were mentioned, according to the answers that pre-service science teachers gave to the request 'criticize the curriculum entreated in the movie'. While the film's giving project-based education and providing skills for competition and struggling were remarked as positive aspects of the curriculum, it was seen that the majority of pre-service science teachers remarked that there aren't any positive aspects of the curriculum. As for negative aspects, the most significant topic that the pre-service science teachers dwelled upon about the curriculum was that the education system was based on rote-learning. Besides that, it was considered that the system had many more negative features such as the fact that it was oppressive, patronizing, theoretical, stressful, ominous, obtunding creative and critical thinking, punishing, not taking notice of personal differences and based on classical methods. The direct quotes from the statements of pre-service science teachers concerning the subject are indicated below.

> F10: "With the curriculum that appears in the movie, the students received an education based on rote-learning. The creativity of the children was completely thrown in the background, out of focus and the important thing was accepted to be simply the repetition of what is written in the book to the brain. This situation has never been adequate to fulfil the learning process. Because recitation is easily forgotten and the learning process fails. As an example of the positive aspects of the curriculum in the movie, it can be indicated that the students are allowed to practise with projects. However, during the practice, the strict rules and tyrannical attitudes affect students in a negative way. While teaching, the teacher should be more flexible and affectionate. In this way learning can be done with ease. Additionally, the rat race in the movie to get the first place led students to all kinds of ways that induce other students to fail. All these affect students' personal development and psychologies in a negative way." (223.201, 06.07.2014).

> F3:; "Notwithstanding the fact that there are many negative aspects of the curriculum in the movie, its giving an opportunity to the students who are volunteers on this project to study well can be considered a positive quality. No matter how many deans cause a student's life to be distressing with a bad attitude

and reject this Project, it is important for the school to attempt to carry on these projects and support them. Nevertheless, no matter how magnificent it is, the school can not attain the expected success if there are still social-peer and school pressure. Or, because the students are forced to remain in a school they don't want, the expected success is not reached. In the curriculum in the movie, there exists a system that is not thought-provoking, based on rote-learning and teacher-centered and this is an obstructive situation for success." (280.438, 06.07.2014).

F66: "In the movie, a curriculum where memorizing is prioritised, pressure came to the fore was used. Nothing is left to the choice of the individual. Their opinions are not valued at all. No opportunity for individuals to learn by wondering, querying, searching was offered. The students are forced to compete with the feeling of failure. However, the only thing that is nice within this system is that the students are offered a business opportunity even before the school is over. In other words, for the successes they receive awards. But on the other hand, how far does it make people happy to work in a job they do not love at all is open to question." (301.581, 06.07.2014).

S33: "Not the capability of what the students can do, but what they can memorize is taken into account in the curriculum in the movie. They are trying to teach a machine with a picture on the board though the case is that it should be taught with an examination of its broken proponents. Besides that, in the movie the deficient students are incapacitated by being made to sit in the back seats and therefore no contact is made with them. These are the most striking scenes that i saw in the movie. But in some parts of the movie, the students are taught to be successful in preparing for life. I mean the importance of working with discipline and having responsibility is emphasized." (207.995, 06.07.2014).

S39: "…in fact, life is a contest against time. In this respect, the system gives students this responsibility. Maybe in this respect the competition of the students may be considered as positive. Yet, it is very bad for the system to be based on rote-learning and for the students to be graded with marks. Because the memorizing is forgettable, but learning sticks in the mind." (194.762, 06.07.2014).

As a second question, the request "Compare the curriculum mentioned in the movie with the curriculum in our country" was directed to pre-service science teachers. The answers, taken from them, are shown in Table 2.

Table 2. Frequency of pre-service science teachers' answers to the second question.

		Curriculum in 3-Idıots		Curriculum in Turkey	
		Codes	Frequency	Codes	Frequency
Similarities	Rote learning	F3, F4, F5, F7, F8, F10, F12, F14, F15, F17, F20, F21, F22, F23, F24, F26, F29, F30, F33, F35, F36, F37, F 38, F39, F40, F41, F42, F43, F44, F45, F46, F47, F48, F49, F50, F51, F52, F54, F56, F57, F59, F60, F65, F66, F68, F70, F71, F72, F 73, F75, F 76, F 77, F 78, F 79, F80, F82, S23, S36	58	F4, F5, F7, F8, F10, F12, F14, F15, F17, F20, F21, F22, F23, F26, F29, F30, F33, F34, F35, F38, F39, F40, F41, F43, F44, F45, F46, F47, F48, F49, F51, F52, F54, F56, F60, F65, F66, F68, F70, F71, F72, F75, F76, F77, F78, F79, F80, F83, FS31, F21, F12, S36	52
	Competitor	F1, F2, F3, F8, F9, F10, F15, F20, F24, F27, F28, F30, F31, F32, F33, F35, F40, F41, F43, F44, F46, F47, F48, F 50, F51, F 53, F54, F55, F56, F58, F59, F60, F61, F63, F64, F67, F68, F69, F70, F72, F73, F75, F76, F79, F82, S36	46	F2, F10, F18, F20, F24, F25, F27, F31, F32, F34, F35, F40, F41, F43, F44, F46, F47, F48, F50, F51, F53, F54, F55, F56, F58, F61, F63, F64, F67, F68, F69, F70, F72, F73, F76, F79, S14, S19, S36	39
	Exam/score anxiety	F4, F5, F7, F8, F12, F14, F15, F17, F18, F19, F20, F21, F22, F23, F24, F27, F28, F29, F33, F39, F43, F44, F47, F48, F49, F51, F52, F55, F56, F58, F59, F71, F73, F74, F76, F78, F79, F81, F83, S 1, S 19, S22	42	F4, F5, F7, F8, F12, F13, F14, F15, F17, F18, F19, F20, F22, F23, F24, F27, F29, F33, F39, F43, F44, F47, F48, F49, F52, F55, F56, F58, F59, F63, F71, F73, F74, F76, F78, F79, F81, F82, F83	39

	Oppressive	F2, F14, F19, F28, F35, F39, F40, F41, F43, F47, F48, F51, F52, F53, F54, F56, F58, F61, F64, F65, F66, F67, F68, F69, F70, F78, F79, S13, S 23, S24	30	Oppressive	F2, F11, F13, F14, F19, F38, F40, F51, F52, F53, F54, F56, F58, F64, F79	15
Differences	Not inquiry based learning	F1, F2, F9, F11, F15, F33, F35, F38, F39, F41, F42, F47, F51, F53, F57, F60, F66, F70, F77	19	Inquiry based learning	F1, F43, F69, S16, S17,	5
	Not support students ideas	F36, F39, F41, F56, F64, F68, F72, F77, F81, F82, S3, S5, S9	13	Incite searching	F1, F39, F57	3
	Prevent the curiosity	F11, F31, F32, F34, F39, F41, F49, F54, F56, F72, F82, S21	12	Incite thinking	F1, F43, S24, S25, S37	5
	Theoretical based	F1, F27, F48, F55, F58, F64, F66, F72, F74, F76, F78, F79	12	Flexible	F2, F4, F12, F17, F20, F28, F34, F47, F48, F58, F60, F65, F66, F67, F68, F69, F78, F79, F81, S27	20
	Teacher centered	F3, F9, F11, F19, F28, F29, F36, F44, F57, F69, F73	11	Student-centered	F9, F13, F16, F26, F36, F37, F51, F77, F83, S36	10
	Behavioral approach	F16, F51	2	Constructivist approach	F13, F16, F36, F42, F51, F76, F81	7

According to the answers of the pre-service science teachers in response to the above request, it was determined that students compared the two curricula in terms of differences and similarities. When Table 2 is examined, it can be seen that the curricula of both countries share similarities from the point of view that both are based on rote-learning, exam-centered, creating worries about grades, rule-based and they incite the students to competition. It was said that the physical science curriculum in the schools in our country is relatively more flexible programs that incite the students to think clearly, to research and investigate. In addition, it was determined that the curriculum was arranged according to the constructivist approach that is student-centered. The direct quotations of the pre-service science teachers regarding the question are stated below:

> F51:"… the education system in the movie is based on behaviorist approach. There is a system that hinders students to progress in the direction of their capabilities and the professions they love. In the movie, the student is not guided to investigate and think. The children are not raised within the framework of their field of interests. The family and the environment have profound effects on the curriculum and choice of profession. The program is not a system that is student-centered. İf we compare it with our education system, there has been magnificent progress nowadays. But in the past, it was very close to this system, both systems were based on rote learning and competition. But now, we pre-service science teachers, receive an education based on a constructivist approach. We make activities and projects. Learning is becoming enjoyable with the current system and a student-centered education emerges. The students are being informed so that they can improve themselves in any field they want." (344.739, 06.07.2014).

> F77: " … education is shown merely as an activity based on memorization according to the education system in the movie. That is, the students are being taught premises and information based on only the sentences in the books without giving them an opportunity to interpret or think. The students are not permitted to express their opinions about a certain topic without the sentences in the books or to develop their ideas. There are still the effects of rote learning on our curriculum, yet when we compare the current system with the old one, it can be seen that student-centered system has taken the place of rote learning. The students are given importance and their opinions are taken into consideration and the learning atmosphere is rearranged in a way to use different prepotents. Significant progress was made in reaching a system where the student is active in our curriculum." (401.118, 06.07.2014).

> S36: "The education system in the movies and the parrot fashion in our education system remain at the forefront. Even today, most of the teachers give education with direct expression and hold examinations based on memorization. The students become like race horses while they race from one exam into another. Yet most of the educationists are not even aware of this. In the movie, the dean took no notice of the opinions of the students in the same manner. However, in our education system the remarks of the students are taken into consideration. The students are asked for their opinions and some arrange-

ments are reached by making the process student-centered. I think this is the most important distinction between these two systems." (315.540, 06.07.2014).

Finally, pre-service science teachers were asked "How do you think the science curriculum should be configured based on the incidents you saw in the movie?" The answers of pre-service science teachers are shown in Table 3.

Table 3. Frequency of pre-service science teachers' answers to the third question.

Themes	Codes		Frequency
In terms of learning areas	Application oriented	F1, F19, F12, F13, F30, F31, F35, F39, F70, F77, F78, F80, F82, F83, S28, S29, S32, S33, S39, S41, S40, S19, S7, S15, S16, S18, S24, S25	29
	Suitable for all grades	F1, F26, F10, F13, F24, F27, F61, F66, F82, S8,	10
	Not intensive	F1, F83	2
In terms of philosophically (Pragmatist)	Students have active role	F1, F16, F2, F9, F20, F19, F11, F24, F28, F29, F30, F31, F32, F33, F35, F36, F37, F42, F44, F53, F57, F67, F68, F71, F73, F81, F82, S8, S26, S27, S25, S34, S35, S41, S1, S6, S11, S23	38
	Takes notice of individual differences	F2, F10, F13, F24, F32, F37, F38, F39, F41, F44, F46, F49, F52, F53, F55, F56, F59, F64, F74, S 37, S 40, S 41, S 1, S 2, S8, S25	26
	Flexible/ renewable / not oppressive	F59, F76, F77, F21, F28, F31, F39, F40, F42, F46, F47, F76, F78, F79, S4, S10, S12, S13, S15, S18, S20, S23, S25	23
	Non-examination assessment	F25, F26, F7, F8, F20, F21, F22, F5, F18, F23, F40, F42, F48, F56, F60, F65, F78, S6	18
	Performance assessment (complementary evaluation)	F20, F22, F25, F26, F43, F54, F63, F73, F79, F81, S28, S35, S40	13
	Teacher is guide	F1, F16, F26, F31, F32, F33, F34, F36, F44, F73, S13, S19	12
	Constructivist	F15, F16, F17, F5, F4, F45, F53, S29	8
	Project based	F28, F36, F61, F65, F77, S3	6
	satisfying the need	F2, F3, F19, F81	4
In terms of acquirements	Not rote learning / All stage of the Bloom taxonomy	F15, F26, F4, F8, F20, F10, F21, F12, F17, F22, F13, F18, F23, F4, F27, F28, F29, F30, F31, F32, F33, F34, F41, F44, F45, F46, F48, F49, F50, F51, F54, F55, F56, F57, F60, F71, F72, F73, F74, F76, F 77, F80, F82, S27, S32, S33, S35, S36, S37, S39, S40, S4, S3, S5, S7, S9, S10, S11, S12, S13, S14, S15, S16, S18, S19, S20, S21, S22, S23, S24, S25	71
	Associated with daily life	F15, F4, F25, F17, F24, F4, F31, F34, F35, F44, F45, F47, F48, F50, F51, F54, F55, F56, F58, F62, F66, F68, F69, F71, F74, F75, S28, S29, S31, S33, S24, S25, S6, S8, S13, S15, S19, S21, S22	39
	Community- environment relation is at the forefront	F1, F54	2
In terms of science literacy person features	Incite to curiosity	F1, F25, F21, F6, F18, F24, F40, F41, F43, F47, F48, F54, F56, F63, F71, S28, S38, S26, S20	19
	Incite to research	F1, F25, F20, F32, F33, F34, F67, F70, F77, F78, F40, S8,	11
	Inquiry based	F26, F11, F38, F52, F70, S29	6
	Incite to discovery	F26, F72, S8,	3
	Incite to critical thinking	F26, F28	2

The pre-service science teachers responded to the question "how do you think the science curriculums should be configured based on the incidents you saw in the movie?" by way of four themes. Firstly, they said that the science program should be suitable for the level of the students, and remarked that the program whose content is

not intensive and where practice remains at the forefront. After that, they indicated philosophically the specialties' of the curriculum according to pragmatic philosophy. For example, they specified that there should be a program selecting a constructivist approach as a baseline, taking personal differences into consideration, prepared to temper to necessities, and be student-centered. As the third theme, the pre-service science teachers remarked that the program should prioritize the relationship between the community and the environment and that it should be related to daily life. As the last theme the pre-service science teachers remarked that the program should be supporting and encouraging the research, investigations, criticisms, curiosity and exploration in terms of the features needed to be acquired so as to be a science literate person. The direct quotations of the pre-service science teachers regarding the question were given below.

> F19: "There should be a program that keeps students active all the time. There should be a system that enables students to make a selection from suitable sectors on the basis of their capabilities and knowledge instead of a professional sector that they will have in the future. There should be a program that uses visual materials to teach the lesson so as to avoid student boredom with the lesson, that is, there should be more practical work in addition to gaining knowledge. The student should definitely aim to learn, not to get a high mark. We need a curriculum that will show the fact that life is not only composed of a diploma, a job and a career. There should be a curriculum through which you can choose the job you truly want to have. In short, there should be a completely student-centered program." (455.217, 06.07.2014).
>
> F44: "…the main purpose of the curriculum is not the memorization of the subject by the students, but their comprehension by integrating them into daily life. The program must take personal differences into consideration. The teacher must guide students and must activate them. The teaching process should be done not only with books but also with group work, experiments and examples from daily life and research. The students should learn not to compete, but to learn thoroughly. And they should realize this with practice and the guidance of their teachers." (409.244, 06.07.2014).
>
> F54: "The students should be given information not about getting high marks in the exams, but in an attempt to establish a connection to life, to be able to realize the incidents around them and comprehend and explain their reasons. Research about which the students are curious should be made, their homework should be given and collected and each student should have a product file throughout the year. They should realize that science is part of life. Instead of the questions like 'where will ı use this information in my life in the future?' they should explain the environment around them by reasoning and establishing a relationship with them. What they have learned shouldn't seem unnecessary to the students. Memorizing shouldn't take place. They should realize their own success by evaluating their point of view with and without that information. With this program, the skills of every child should be revealed." (501.622, 06.07.2014).
>
> S8: "…as can be seen from these plotlines, the curriculums should be supporting different searching-thinking-incentive opinions, as well. The programs must be such as to strengthen the intelligence rather than hebetate the students with poor implementation of curriculum. İt should support the distinctions and be suitable for the students and also it should be designed bearing in the mind that every student can be different. The student should be central and the facts such as thinking, imagining, designing, innovation must be given particular importance." (412.808, 06.07.2014).
>
> S29: "I think a curriculum, that is logic-incentive, applicable, comprehensive and complying with life should be configured. That is to say, a program that accords with the saying 'do not give me fish, teach me how to catch one' should be planned. It should be organized in a way that creates a querer learning atmosphere. For example: we need to learn all the things that we have to know regarding the teaching profession consciously and with practice. As stated in one of the sayings in the movie, it is like when we say how well this lion was taught manners when the lion tamer commands it to sit. After we see how the courses are practiced and then don't practice these in the class personally, we can only turn out to be teachers who saw the practice but cannot implement it." (479.223, 06.07.2014).

Discussion

This research, has aimed to examine the opinions of pre-service teachers about the curriculum of science lessons based upon the stories in the 3 Idiots movie. In this research, firstly, the answers that were received to the questions to the pre-service teachers are shown in the tables for the purpose of seeing the frequency, code and theme. The pre-service teachers were required to criticize a physical science lesson's curriculum that was the subject of this movie. The topic of this film is based on the curriculum of India. The story of this movie was taken from the events that occurred in the best university in India. These pre-service science teachers watched this movie and the frequency of codes about the curriculum of physical sciences is shown in the table. When data in table 1 is analyzed, it informs codes that can be divided as positive and negative aimed at the curriculum. The topic that focuses on the movie appertaining to the curriculum is based on memorising. In addition to this case, the pre-service teachers highlighted many negative cases, such as: the education system is repressive-insistent, theory based, worrisome and stressful, teacher centered instruction, the suppression of thrill and curiosity, damping the thoughts, poor execution, does not take notice of individual differences and is based on time–honoured practice. Pre-service teachers highlighted some positive cases in this movie. These are: the curriculum is disciplined, applicable, based on competition and struggle, develops a sense of responsibility. The results of studies taking part in the literature emphasize similar positive features about the curriculum of the movie (Shukla, 2005; Desiraju, 2008; Prakash, 2014).

The other survey question is that pre-service teachers compare differences between the physical science curriculum of India (movie) and the curriculum of Turkey. In response to the request 'compare differences between the physical science curriculum of India and the curriculum of Turkey's curriculum', teachers gave the answers that data could be divided into differences and similarities under two themes.

From the analysis of table 2, pre-service teachers found that the curricula of both two countries were based on memorising, brought into competitive behaviours, focused on the exam, normative, and caused grade-exam concern. There are some studies that use similar expressions connected with the effective curriculum in Turkey (Erarslan, 2004; Erzan, 2005; Gündoğdu, Çimen & Turan, 2008; Gür & Çelik, 2009; Erdem & Soylu, 2013; Başol & Zabun, 2014). As differences the teachers highlighted that the curriculum in the movie did not support the opinions of students, blunted the curiosity, was behaviourist, teacher-centered, theory-intensive, and encouraged learning without questioning. The curriculum of physical sciences in Turkey's schools is based on practice, brought into thinking, investigating, questioning and is a relatively flexible curriculum. Also, opinions, such as: the curriculum was student-centered and was prepared according to the constructivist approach, were determined. The answers in the study related to constructivist approach show parallels with this result in our country (Bağcı Kılıç, 2001; Küçükyılmaz, 2003; Arslan, 2005; Erdoğan, 2005; Gözütok, Akgün & Karacaoğlu, 2005; Yangın, 2005).

Consequently, how does the curriculum of the physical science lesson need to be structured based upon the movie? We had such a question for pre-service teachers. And the answers of pre-service teachers were given as the themes and codes in Table 3. Pre-service teachers said that the curriculum of physical sciences must be suitable for the level of students, practice must be in the forefront and the curriculum must not have heavy content. After that, they stated the features of the physical science curriculum according to the pragmatic philosophy in terms of philosophical theory. These features of the physical science curriculum are that this new curriculum must have a constructivist approach, be prepared for the needs of students, be student-centered, encourage learning, investigating and take account of individual differences. Thirdly, they said that the society- environment relationship must be in the forefront and this curriculum must be associated with life from the point of acquirements. And finally, they said that the physical science curriculum must be a leader for investigating, interrogating, criticising, curiosity and reconnoitering in terms of features that must be acquired in order to be a science literate individual.

The answers that the pre-service teachers gave show parallels with features that must be in the physical science curriculum (Ball & Cohen, 1996; Kaptan & Korkmaz, 2001; Kaptan & Kuşakcı, 2002; Barab & Luehmann, 2003; Davis & Krajcik, 2005; National Research Council, 2007; Forbes & Davis, 2008; Davis & Smithey, 2009; Mikeska, Anderson & Schwarz, 2009; Osborne & Dillion, 2010).

Moreover, when the literature review movies are used by researchers in various fields, for example, Barnett and others (2006) found that students who had watched a science-fiction movie had a lot of misconceptions about the nature of the Earth. Similarly, Efthimiou and Llewellyn (2004) have created a movie course in which students analyze movies using the scientific principles they were learning in physics class. Otherwise, Barnett and Kafka (2007) have discussed pedagogical advantages and challenges of using movies in an introductory science class

for elementary teachers. They indicated two instructional episodes which used scenes from the movies Red Planet and The Core to engage students in critiquing science as presented in the films. Liberko (2004) said that movies can create lasting mental images that are correlated to the underlying scientific theories. This can help students better understand many of the concepts that are covered in the sciences, especially physics and chemistry concepts. Also, researchers have indicated that the use of movies to teach science enhances student interest toward science because film often relates the science being presented to socially important issues, which makes science more relevant to students (Dubeck, Moshier & Boss 1995; Brake & Thornton 2003). On the other hand, many researchers have studied the 3-Idiot movie. Anwar (2012) examined the educational values in the 3 Idiots movie. Krisnawati (2011) studied the psychology of Raju's character in the movie. On the other hand, Herdindha and Riyanto (2014) studied parental pressure and how it has an impact on the children in 3 Idiots. And they indicated that the impact of the pressure makes students anxious. From this study it can be seen that movies may be used to reveal the perceptions about the topic.

Conclusions

This research, has aimed to examine the opinions of pre-service teachers about the curriculum of science lessons based upon the stories in the 3 Idiots movie. The topic of this film is based on the curriculum of India. The story of this movie was taken from the events that occurred in the best university in India. Firstly, the topic focused on in the movie that appertains to the curriculum in memorising and the pre-service science teachers highlighted many negative cases. Such as the fact that the educational system is repressive-insistent, theory based, worrisome-stressful.. ,etc. Also, pre-service teachers highlighted some positive cases from this movie. These are: the curriculum is disciplined, applicable, based on competition and struggle, and develops a sense of responsibility. Then, pre-service teachers drew attention to that the curricula of both countries were based on memorising, encouraged competition, focused on the exam, were normative, and caused grade-exam concern. As differences the teachers stated that the curriculum in the movie did not support opinions of students, blunted curiosity, and was behaviourist, etc. Pre-service teachers said that the curriculum of physical sciences must be suitable for the level of students, practice must be in the forefront, and the curriculum must not have heavy content. Also, the pre-service science teachers remarked that the program should be supporting and encouraging research, investigations, criticisms, curiosity and exploration in terms of the features needed to be acquired so as to be a science literate person. It was seen, that 3-idiots movie is a good sample for observing the educational programme. It was a provided opportunity for pre-service science teachers to show the educational programme and to compare. Pre-service science teachers, in the light of the research results, have developed the following recommendations:

1. In this research the 3-Idiot movie was used. Others advised the use of educational movies by MEB (2013b) in the research.
2. The 3- Idiots movie was used to determine the perceptions of pre-service science teachers about the science curriculum in this qualitative research. This movie could be used in experimental studies.

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Received: *April 14, 2015* Accepted: *June 05, 2015*

Ayşe Nesibe Köklükaya PhD., Instructor, Gazi University, Gazi Faculty of Education, Department of Primary Education, Division of Science Education, Ankara, Turkey.
E-mail: nkoklukaya@gazi.edu.tr