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Comparison of in-Service Science Teachers' and Pre-Service Science Teachers' Opinions for the Fifth Grade Science Textbooks in Primary Schools

Yunus KARAKUYU, Uşak University Faculty of Education (Turkey)

Abstract : *In this study, it was aimed to determine pre-service science teachers' and in service-science teachers' opinions on the renewed 5th grade science tetxtbook. The science teacher sample is 82 fifth grade in service science teachers from 12 schools in the city center from interior of Aegean region, and the pre-service primary science teachers sample is 280 students of the primary department of the faculty of education students in a state university, from south region of Turkey in 2014-2015 academic years. There are 50 questions arranged in five sections in this scale. The first section is about the questions to reveal teachers' personal informations. The second section is about scientific contents, the third section is about the educational techniques and methods. The fourth section is about readibility and the fifth section is about the activities. At the end of the study, it was found that there was a difference between in service-science teachers' graduated from 'education high school' had significantly higher scores than education faculty graduates. It is seen that science teaching techniques and methods are taught to the pre-service science teachers at the bachelor's degree and the graduated education degree. New generation science teachers who have bachelor's degree and the graduated education degree don't take into consideration the spelling and grammer of subjects. New generation in service-teachers know the constructivism approach and alternative teaching methods and techniques very well so that they can apply the activities and attach importance practical courses.*

Key Words: *In-service science teacher, Pre-service science teacher, Science Textbook.*

1. Introduction

Every age and every society has different tendencies, desires, and aims which are being shaped in the course time. In this context, there is need for qualified, educated individuals which will meet these different shapes being mentioned. In recent years, analyses of Turkey's evolving program studies about Science education have focused on student centered approaches instead of traditional instructions. On traditional Science instruction, the student becomes passive and depended on the teacher, the students'misunderstandings are not displayed in the system, and force students to memorization. Nonetheless, with the new science curriculum that have been put into practice in 2014, Science books were changed as science books too.In these books, contents of which are also changed besides their names, constructive approach has become the focus instead of traditional approach. Textbooks are the best tools to supply the development of countries, societies, and individuals in terms of knowledge. Throughout the history, any tools can commute books. Books are tools which have the biggest contribution to development and conformation of human life. In addition, according to Cletta and Chiappetta (1989), books, introduction of

which can obviously be seen, should be qualified enough to be used in every school that has different possibilities around different regions of the country.

Equipping the students with some features, about which people from all aspects of the society will have a say will come true owing to qualified course books and the education which will be presented to them. The books, which ensure information on their working topics in activities about education programs, give certain clues and direct to research and examine the studentsin the directions of the targets to endow students with appropriate behaviours, and are elements of a suitable environment and learning-teaching process (Küçükahmet, 2001). Textbooks are education resources which have been used for centuries. From the point of view of students, the biggest advantage of the textbooks is to ensure the student to repeat the information again and again and warrant learning according to individual speed.

Text books are still important tools in planning, application, evaluation and improvement of education and teaching activities. In traditional education and teaching institutions, while teachers are improving their annual, monthly, daily and even hourly lesson plans, they still use text books. The students see text books as a guide in viewing the topics which were taught, in getting ready for exams and prefer not getting out of the book (Çoşkun, 1996). According to Pelletier (1995), textbooks which have great importance are one tool mainly used in education because they ensure the teacher to teach systematically and regularly (Karamustafaoğluand Üstün, 2005).Textbooks areviewed as the best tools to assist teachers in this regard. Textbooks also contribute teachers for content knowledge and communication skills to resolve differences, and students are provided with the opportunity to use appropriate teaching methods and techniques. On the other hand they limit the covered topics for mid-level and set boundries to teaching plain (Tosunoğlu and Aslan, 2001). Types of homeworks, the scope, level and arranging the time through the textbooks are easier. In addition, questions in textbooks allow student to review the subject objectively (Güneş, 2002).

Learning features in textbooks as a whole (taking into account the developmental characteristics) can be edited and managed. This facilitates the work of the teacher and makes them feel comfortable in the student's environment (Kılıç and Seven, 2003). Textbooks help involve students' capabilities of developinglife-long skills and interests. To compose a solid knowledge on students is the most impotrant way to create a strong personality. Developments of thoughts by means of public may result in personal instability. To have a full knowledge in a field will enhance behavior of an individual and strengthen the personality. For this reason, textbooks are the basis for sound individuals who have taken training (Güneş, 2002).

The effectiveness of a document depends on three subjects.

1- The readability

2- The content

3- The design of material (Yalın, 1999).

Taking these aspects into consideration, the choice of a Science

textbookshould consist of following features:

- It must be the truly scientific and up to date
- It should not lead to any misunderstanding
- It should emphasize the relationship between the society and science-technology
- It must show the aspects of science (not justa mass of information)
- Its language should be open not strict (like "its unknown" "there are contradictory comments about it" etc.)
- It must make it clear that knowlege can change in time
- The historical developments should be presented.
- It must involvethe ways of reaching the information, the ideas, and getting the results.
- It must offerportraits ofrealscientistsandtheirapplications in orderstudentsto learn to resolvethe uncertainty ofscientificstudy.
- It must discuss the authenticity of specificscientificquestions
- It must discuss theresearch behind conceptsandprinciples, such as whatwas observed, howthe researchwasdoneorwhathas caused in the making of the study.
- It should encouragethe students to use scientificprocesses, to make quick decisions when they facethe problems.It must involve activities that will develop the creativity skills of the students,
- It must help to develop positive attitudes against science and scientificfields.

1.1. General Research Problem

Is there a statistically significant difference between averages of the scores that in service-teachers'"educational level", "seniority" and "choice of bookpreference" variables and depending on the pre-service primary teachers' "the choice ofbookpreference" variables of the fifth grade science textbook which changes with Primaryscienceprogram that was started to implement on 2014 academic year ?

1.2. Research Questions

1. Is there a statistically significant difference between averages of the scores those in service-teachers' 5th-grade Science Textbook Evaluation Inventory "scientific content" sub-dimensional according to "Educational Level" variables?
2. Is there a statistically significant difference between averages of the scores that in service-teachers' 5th-grade Science Textbook Evaluation Inventory "the techniques and methods" sub-dimensional according to "Educational Level" variables?
3. Is there a statistically significant difference between averages of the scores that in service-teachers' 5th-grade Science Textbook Evaluation Inventory "readability" sub-dimensional according to "Educational Level" variables.
4. Is there a statistically significant difference between averages of the scores in service-teachers' 5th-grade Science Textbook Evaluation Inventory "activities" sub-

dimensional according to "Educational Level" variables?

5. Is there a statistically significant difference between averages of the scores in service-teachers' 5th-grade Science Textbook Evaluation Inventory about "teachers' seniorities" variables?
6. Is there a statistically significant difference between averages of the scores that pre-service primary teachers' 5th-grade Science Textbook Evaluation Inventory according to "the choice ofbookpreference" variables?
7. Is there a statistically significant difference between averages of the scores that pre-service primary teachers' and 5th-grade elemanteryteachers'5th-grade Science Textbook Evaluation Inventory according to "the choice ofbookpreference" variables?

2. Method

2.1. Type of the Research

The survey model is used in this study. This model is a research approach aiming at describing an existing situation in the past or present. The event, the person or the object as the research subjects are tried to be defined in their own conditions. There is not any effort to influence or change them in any way. The existing state which is wanted to be known is investigated. The important thing is observing and identifying it properly (Karasar, 1998).

2.2. Subjects

The subjects of this study were in-service science teachers and pre-service science teachers. The teacher populations the fifth grade in service science teachers from interior of Aegean region, and the pre-service primary science teachers'populations the primary senior students of the faculty of education. The teacher sample is 82 fifth grade in service science teachers from 12 schools in the city center from interior of Aegean region, and the pre-service primary science teachers sample is 280 students of the primary department of the faculty of education students in a state university, from south region of Turkey. When personal information of the teachers in the sample group was viewed, the data on the educational institution in service-teachers graduated from are as follows: 28 (34,2%) of the research participants graduated from an education high school; 44 (53,6%) of them graduated from afaculty of education and 10 (12,2%) of them graduated from a graduate college (Table 1).

Table 1. Information about the In Service Science Teachers' Educational Level.

Educational Institution In Service Science Teachers' Graduated	(f) The number of the teachers	%
Education High School	28	34,2
The Faculty Of Education	44	53,6
Graduated Education	10	12,2
Total	82	100,0

The data on the in service science teachers' seniority are as follows: 17 (20,7%) of the research participants serve in the range of 1-10 years; 35 (42,6%) of them serve in the range of 10-20 years; 30 (36,7%) of them serve over 21 years (Table 2).

Table 2. Information about the In Service Science Teachers' Seniority.

Seniority	(f) The number of the teachers	%
1-10 years	17	20,7
11 -20 years	35	42,6
21 years and over	30	36,7
Total	82	100,0

2.3. Measurement Tools

Science Textbook Evaluation Inventory (STTEI): This scale was developed by Köseoğlu and Atasoy (2003). The scale developed for evaluating the Science textbook according to the in service-teachers' and pre-service teachers' opinions is a 5-point Likert type comprising 50 items. The Likert scale was scored as follows: "1=So insufficient, 2= Insufficient, 3= Sufficient partially, 4= Sufficientand 5= So sufficient". There are five dimensions to the scale: there are questions to learn teachers' personal informations in the first section; scientific content in the second section; techniques and methods used in the third section; readability in the forth section and questions aiming to establish views of the teachers about activities in the last section. The validity coefficient of the scale was 0.964. Internal consistency coefficients of the scale were 0.943 for the 20 items scientific content dimension, 0.879 for the 10 items techniques and methods dimension, 0.893 for the 10 items readability dimension and 0.928 for the 10 items activities dimension.Form of investigation which we work on, is composed of 5 chapters. First chapter including 3 statements is about personal qualifications of teachers. There are 20 points related to scientific content qualifications of book at 2nd chapter, 10 points related to techniques and methods qualifications of the book at 3rd chapter, 10 points related to readability qualifications of the book at 4th chapter and 10 points related to the activities of the book at 5th chapter. The investigation is composed of 50 points totally. In-service teachers and pre-service teachers answer these questions by marking one of these choices: "so insufficient, insufficient, and sufficient partially, sufficient, so sufficient.

Score data were obtained by dividing space number into choice number to comment on levels of teachers' attendance to the choices in the investigation(4\5=0,80)(Table 3; Tekin, 1996).

Table3. Score Scale with 5 Range.

SCORE SPACE	CHOICES
1.00 - 1.80	So insufficient
1.81 - 2.60	Insufficient
2.61 - 3.40	Sufficient partially
3.41 - 4.20	Sufficient
4.21 - 5.00	So sufficient

2.4. Data Analysis

Data obtained from fifth grade primary in service-teachers' and the pre-service primary teachers were entered into the SPSS 13 statistical package. The research questions were analyzed by ANOVA. Kruskal Walls test was used for the case where the distribution is not normal and also, in order to determine the significant difference between the groups Mann Whitney U test was applied.

2.5. Treatment

This study which aims to reveal teachers' and pre-service teachers' opinions is, in general, a descriptive scanning model. Scanning method is a research approach which aims to describe a real situation which existed in the past or still exists. Thoughts, opinions and attitudes of people are obtained by the scanning method (Erözkan, 2007). For this reason this research includes 82 primary school in service-teachers working in the city centre from interior of Aegean region and 280 pre-service teachers working in a state university from south region of Turkey, Primary School Teacher Department in 2014-2015 Academic Year. As the Evaluation Form, a Questionnaire involving 5 parts is applied. Science Textbook Evaluation Inventory (STTEI) is used to identify the views of in service-teachers, who were teaching 5th Grade students, and final-year pre-service teachers, who were trained to observe the field Textbook and the Science Textbook. This Inventory has been prepared as five- Likert item. A total of362 inventorşes were evaluated. There are 50 questions arranged in five sections in this scale. The first section is about the questions to reveal teachers' personal informations. The second section is about scientific contents, the third section is about the educationaltechniques and methods. The fourth section is about readibility and the fifth section is about the activities.

3. Results

One-way analysis of variance (ANOVA) was used to test whether there was a statistically significant difference between evaluations according to the variable sub-dimensions to Primary 5 Classroom teachers' gradutes in Science textbook inventory.

Table 4. Results of Textbook Evaluation Inventory "scientific content" sub-dimensional according to "Educational Level" variables.

Dimensions	Educational Level	N	$\overline{X}$	Sd	F	p	LSD
Scientific Content	Education high school (1)	8	4,893	9,767	3,128	,036*	1 ile 2
	Faculty of Education (2)	4	8,442	14,211			
	Graduated-education (3)	0	1,662	10,137			

* P <0.05

As seen in Table 4, one-way ANOVA was used to test whether there was a statistically significant difference according to educational status variable. Textbook Evaluation Inventory sub-dimensions showed a significant difference between the arithmetic mean of the educational status of teachers according to the variable, "scientific content" sub-dimension (p = 0.036). To determine the difference of "scientific content" sub-dimension that emerged in which groups complementary Post Hoc LSD test was used.

The results showed that the difference emerged at the sub-dimension of "Scientific Content" is in favor of Education High School graduates between the Education High School graduates (X=74,893) and Education Faculty graduates (X=68,442). Additionally, Education High School graduate teachers seemed more proficient in 5th Grade Science Textbook than the Education Faculty graduate teachers.

Table 5. The Results of Textbook Evaluation Inventory "The Techniques and Methods" sub-dimensional according to "Educational Level" variables.

Dimensions	Education Level	N	$\overline{X}$	sd	F	p	LSD
Techniques and Methods	Education High School(1)	28	32,142	7,351	3,00	,046*	3 ile 1
	Education Faculty (2)	44	36,893	5,431			
	Graduated Education(3)	10	37,158	4,137			

As shown in table 5, ANOVA resulted in a meaningful difference between Graduated-Education graduates (X=37,158) and Education High School graduates

(X=32,142) in terms of Techniques and Methods sub-dimension, and Graduated-Education graduate teachers had the highest score (p= 0,046).

Table 6. Results of Textbook Evaluation Inventory "Readability" sub-dimensional according to "Educational Level" variables.

DIMENSIONS	Education Level	N	$\overline{X}$	sd	F	p	LSD
Readability	Education High School(1)	28	37,142	4,351	3,048	,041*	1 ile 3
	Education Faculty (2)	44	36,363	4,981			
	Graduated Education(3)	10	33,158	6,874			

As shown in Table 6, in terms of the sub-dimension of readability, the results of Textbook Evaluation Inventory the sub-dimension of "Readability" to variable "Education level" showed a significant difference between Education High School graduates training teachers and Graduated Education teachers Education High School graduates teachers ($\overline{X}$ =37.142) had significantly higher score than the Graduated Education graduate teachers ($\overline{X}$ = 33.158). According to these results, the teachers who graduated from Education High School, compared to those who graduated from Graduate Education stated that Science textbook of 5th grades is more adequate in terms of Readability.

Table 7. Results of Textbook Evaluation Inventory "Activity" sub-dimensional according to "Educational Level" variables.

DIMENSIONS	Education Level	N	$\overline{X}$	sd	F	p	LSD
Activity	Education High School(1)	28	31,653	7,627	3,074	,043*	2 ile 1
	Education Faculty (2)	44	37,927	4,241			
	Graduated Education(3)	10	36,183	5,107			

As shown in table 7, according to the educational level in Textbook Evaluation Inventory sub-dimension of 'Activity', there is a significant difference between the graduate teachers of Education Faculty and the graduate

teachers of Education High School (p=0,043). According to these results, teachers graduated from Education Faculty are more efficient in terms of the activities which are in the textbook of Science for fifth grade than the others

Table 8. Findings Seniority Factor of Textbook Evaluation Inventory.

Seniority	N	$\overline{X}$	sd	F	P	LSD
1-10 years	17	70,3243	11,073	,534	,711	
11-20 years	35	73,583	12,018			
21 years and more	30	71,682	12,148			

*p<0,05

As seen on table 8, Textbook Evaluation Inventory the sub-dimension of "seniority" to variable "Education level" showed no significant difference among seniority levels. This result indicated that in the evaluation of Science Textbook of 5th grade of primaryeducation, the teachers did not have any different point of view according to their seniority.

Investigating Textbook Lesson in previous programme but not in the present study, last grade primary pre-service teachers have investigated the Science Textbook of 5th grade of primary school. According to Textbook Evaluation Inventory, the views of last grade primary pre-service teachers of primary education department are presented in Table 9:

Table 9. TheViews of Last Grade Primary Pre-Service Science Teachers

	The views of pre-service teachers	$\overline{X}$
	Scientific Content	8,34
2	Techniques and Methods	4,21
3	Readability	4,29
4	Activities.	3,89

According to views of pre-service teachers' Scientific Content, Techniques and Methods, Readability and Activities variables, there was not any statistically meaningful difference among the arithmetic averages(p=0,165).

To determine whether there was a statistically significant difference between averages of the scores that pre-

service primary teachers' who had Textbook Investigation Lesson and 5th-grade elemantery teachers who taught 5th-grade Science Lesson, 5th-grade Science Textbook Evaluation Inventory according to "the choice of book preference" variables, independent t-test was applied and the results were displayed in Table-10.

Tablo 10: The Results of Independent t-Test according to the Pre-Service Primary Science Teachers' and In-Service Science Teachers' Opinions.

Status	N	$\overline{X}$	s.d	t	P
Pre-Service Primary Science Teachers	280	43,83	16,12	17,70	0,00
In- service Science teachers	82	67,52	14,89		

As seen on table 10, there was significant difference between the scores of pre-service primary teachers and fifth grade teachers taken from the criteria of Textbook Evaluation Inventory Independent t-Test showed that teachers had significanty higher scores ($p < 0,05$).

4. Discussion

According to the results regarding student's book freely given by ministry of education, there are some differences in service-teachers' view (according to level of education) about fifth grade science textbook. When we look at the results about scientific content of fifth grade student's textbook of science according to factor of education level; it was found that there was a significant difference between the avarages of in service-teachers' graduated from education high school had significantly higher scores than education faculty graduates. This difference is based on the acceptance of subjects in student's book due to scientific aspects by in service-teachers graduated from education faculty. Therefore, in service-teachers graduated from education faculty will have to be taken some in-service courses about scientific content of science. More scientific contents are to be given to the pre-service teachers on science courses in all of education faculties in turkey. Çakıcı (2012) examined two different 4 and 5 grade science text boks which were published by the Ministry of Education. According to Çakıcı, science and technology text boks provided a comprehensive scientific literacy themes. Çakıcı (2012) examined four different science text books and pointed out the yare not so different from each other about scientific literacy, but the science and technology textbooks of Ministry of Education have stated a more balanced manner from the others. Pre-service teachers which graduate from education faculties can only be teachers at the ministry of education schools. Likewise, in service-teachers graduated from graduated education indicate that primary school fifth grade student's book of science is more sufficient in terms of techniques and methods compared to in service-teachers graduated from education faculty. It is seen that science teaching techniques and methods are

taught to the pre-service teachers at the bachelor's degree and the graduated education degree. And also some in-service courses or activities or programs will be organized about science teaching techniques and methods to the teachers graduated from education high school. In a study that worked out by Bakar, Keles and Colakoğlu (2008), teachers made a complaint about insufficient of time for applying the course activities and lack of pictures as visual elements. Morris (2014), examined science textbooks in terms of their socio-scientific issues, of used in renewable genetic technology and climatic change. He said that science boks are included these subjects in general, but It is not adequate.

According to sub-dimension of readability, the in service-teachersgraduated from education high school indicate that primary school fifth grade student's textbook of science is more sufficient according to readability compared to in service-teachers graduated from graduated education. New generation teachers who have bachelor's degree and the graduated education degree don't take into consideration the spelling and grammer of subjects. Finally, according to sub-dimension of activity the in service-teachers graduated from education faculty indicate that primary school fifth grade student's textbook of science is more sufficient according to activity compared to in service-teachers graduated from education high school. New generation in service-teachers know the constructivism approach and alternative teaching methods and techniques very well so that they can apply the activities and attach importance practical courses. Nevertheless the teachers in service-teachersfrom Education High School know traditional teaching methods and techniques not practical activities and courses.

There is no important difference depending on the variance of the seniority of teachers. Accordingly, they think that science textbooks are suitable for students in terms of scientific content, techniques and methods, readability, and activities. According to the variances of seniority levels, it is seen that there are agreement among teachers and it is believed that the textbooks are appropriate in terms of the criteria.The points which they get from Textbook Evaluation Inventory do not change according to their seniorities. It is determined that the average of professional status of in service-teacherswho work for the years between 11 and 20 is more positive than the averages of teachers who work more than 20 years and who work less than 10 years. There was difference between the status of teachers and the points which they get from Textbook Evaluation Inventory. It is determined that there is a difference between the scores which in service-teachers and pre-service primary teachers from Textbook Evaluation Inventory and their status.

In service-teachers attitudes for inventory assessment of textbook are more positive than pre-service primary teachers. This indication is explained in this way: there is a significant relationship between attitude of inventory assessment of textbook and statue. Teachers who are always engaged with textbook analyze better thanpre-service primary teachers. Lim and Shin (2014), have examined the science stories in sixth grade sciencebooks, whether students understand and strained about

science stories. They signified that students have a positive approach towards science stories, but, cause of difficult understanding the stories, motivation of the students was decreased.

5. Recommendations

Primary school is most important period in terms of students' knowledge and perception level. In this period students are equipped with knowledge and behavioral skills which will shape their future learning experiences. In this respect; while textbooks are being prepared, well trained experts in their respective fields should be employed. When Ministry of Education (MEB) and Board of Education (TTK) choose these Textbooks, they should act meticulously.Furthermore, the teachers and scholars that will be assigned for developing, evaluating and examining the lesson books should be chosen very carefully. It should not be forgotten that this matter is strict and it requires experience and further knowledge.

The topics in the Science classes should be current and should devoid from the informations directing students understanding, and should encourage them to activities which makes them think by criticising and reflecting. The language and narrating features which used in science and tachnologyclassshould be appropriate for level of students. There will be technical words used in science and new concepts which students will see in the first time. It should be prepared a wide extent dictionary forconcepts behind the book.

While the activities are designed, the students' level and learning environment should be taken into consideration. The materials which will be used in the classshould be found easily and activities should be organised accordingly. Furthermore, activities should direct students to researches of science and should be appropriate for them to show their performances.

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