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Teacher Training Process in Turkey: Teachers with Certificate or Diploma

Yeliz Temli-Durmuş[1], Derya Karakelle-Şen[2]
[1]Assist. Prof. Dr. at Uşak University, Educational Sciences Department, ORCID ID: 0000-0003-0769-8782
[2]Res. Assist. at Atatürk University, Educational Sciences Department Educational Sciences Department, ORCID ID: 0000-0001-5699-8066
Email: yeliz.temlidurmus@usak.edu.tr, deryasn@yahoo.com

Abstract
The purpose of the study is to determine the differences between teachers graduated from elementary science teaching departments and those from physics, chemistry, biology teaching aimed at training teachers for high schools in terms of sources of self-efficacy. In total 67 women and 60 men Science Teachers participated in the study voluntarily. Independent sample t-test and Mann Whitney U test were used. The results showed that Science Teachers who graduated from Faculty of Education Science Teaching department had lower total score (M= 126.28) then teachers who graduated from Faculty of Education Chemistry, Physics and Biology Teaching Departments and Faculty od Science and Arts Chemistry, Physics, Biology departments who were appointed as Science Teachers to Middle Schools (M= 134.88). Mastery Experiences Factor shows statistically significant differences (p<0,05). Middle School Science teachers who graduated after re-structuring in education have (M= 44.25) statistically significantly lower mean score then science teachers who took Chemistry, Biology or Physics Education in Science and Art Faculties or Faculty of Education (M= 48,06). Additionally, Social Persuasion score of post structure graduates (M= 24,37), statistically significantly lower than pre-structure graduates (M= 27,48).

Key words: Teacher training history in Turkey, science teachers, certificate programs, self-efficacy sources.

Introduction

Being the first level of formal education, elementary school education has an important mission of providing students with the basic knowledge, skills, attitudes and habits which lead them not only through their further education but also through their whole lives (Demirtaş, 1987 as cited in Algur, 2002).

Teachers as an important factor in this endeavor affect the quality and success of the school experiences of students. Moreover, elementary school teaching has a great importance in students' life as it constitutes the basis for further education. At that point, it is obvious that teacher training system should provide schools with effective teachers to realize this mission. As Algur (2002) states this is an ongoing process and revision and continuous improvement of the system based on societies' and learner' needs is required. With this purpose, in Turkey, restructuring efforts of teacher training system has been put intopractice in 1998.

The reasons of restructuring declared in 1997 by The Counsel of Higher Education (HEC) could be categorized under four major headings. The experienced chaos regarding the mission of the educational faculties was stated as one of the main problems and strengthening of missions in all faculties was declared as an important aim (Başkan, 2001). At that time, although training of teachers was considered as the main responsibility of the faculties of education (Kavcar, 2002), the demand for alternative certificate programs mostly came from graduates of art and science faculties (Sözer, 1991, p.49).

The shortages of classroom and pre-school teachers were the other concern for the restructuring efforts. The third main justification which was strongly related with the teacher shortages was the extension of the compulsory continuous education from 5 to 8 years (Başkan, 2001). The last but not the least important factor was related to existing practices in educational faculties at that time. In fact, careful examination of teacher training patterns before 1997 proves the evidence that teachers who were trained as secondary schools (high school) were mainly appointed as natural science teachers for 6th, 7th and 8th grades. Relatedly, insufficient field practice and knowledge about contemporary teaching technology were stated as major issues. In order to solve these problems, restructuring with the emphasis on the

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requirement for more courses regarding the teaching profession was put into practice (Ergün, 2001 as cited in Tural-Güllaç, 2003).

After implementation of restructuring, some research which aimed at determining the opinions of deans, deans' assistants and professors were carried out. According to the results of these studies, Field Experience I and II courses were stated as the one of the most important and strong aspects of the restructuring process because of the belief that these courses would provide teachers with the professional consciousness (Başkan, 2001; Algur, 2002; Aypay, Şahin & Işık, 2003; Tural-Güllaç, 2003). Besides, one of the most frequently mentioned short-coming according to these research results was duplication. That is, although the faculties of education are responsible for training teachers; art and science faculties also seem to assume the same role of the teacher education for secondary schools (Kıran, 2002; Kavcar, 2002; Aypay, Şahin & Işık, 2003; Şimşek, 2005).

Regarding the outcomes of restructuring, Tural-Güllaç (2003) mentions the increase importance given to the elementary education. In this respect, different departments were opened such as elementary mathematics education and elementary science education.

After restructuring put into implementation, some lesson added to program like classroom management and number of teaching profession lesson was increased. At that respect, graduates from elementary science teaching took more courses regarding teaching profession and it can leads to differences between graduates before and after restructuring.

Purpose of the Study

The purpose of the study is to determine the differences between teachers graduated from elementary science teaching departments and those from physics, chemistry, biology teaching aimed at training teachers for high schools in terms of self-efficacy.

The study mainly focused on the following research question:

1.3. Do self-efficacy beliefs differ for science and technology teachers who graduated before the restructuring period and those who graduated after the restructuring period in centre of Uşak City?

Null hypothesis are:

Ho1: There is no significant difference between science and technology teachers who graduated before the restructuring period and those who graduated after the restructuring period in terms of their self-efficacy beliefs in Uşak centre.

Significance of the Study

In order to train high quality educational staff, professional development and receiving professional knowledge are very important issues. Therefore, teaching profession courses have great importance for teacher performance. Relatedly, restructuring emphasized this concern. In this study, interpreting the results of restructuring in terms of related self-efficacy could provide better understanding regarding the outcomes of this endeavor, which includes more emphasis on profession courses.

Şimşek (2005) stated that the teachers who graduated from physics teaching education or chemistry teaching education are reluctant to teach elementary school level courses. In that respect, data gathered from science teaching efficacy beliefs instrument will provide a clear identification to determine the difference between teachers graduated from elementary science teaching and those from physics, chemistry, biology teaching.

Although Turkey has a rich background and experience in teacher education, emphasizing the quality of teachers rather than quantity is attracting people's attention during years (Kavcar, 2002). Regarding quality; self-efficacy beliefs are important issues that influence the teachers' performance. Hence, it is believed that the opportunity to compare previous teacher training system with the current one could enhance our understanding of teacher education needs.

It is expected that this study will lead to new studies which, apart from the mentioned variables, will include some other variables such as differences of teachers' needs, differences of teachers' expectations from school administration. Besides, future research could focus on some other fields like elementary mathematics education, and foreign language education.

The results of the study will give a chance of determining the contribution of model for training elementary science teachers and comparing the model with previous one regarding the effect of model on teachers' self-efficacy.

Definition of Terms

Self-efficacy: "People's judgment of their capabilities affect their desires, how much effort they mobilize in pursuit of adopted goals, and how they respond to discrepancies between their performance and what they seek to achieve" (Bandura, 1986, p. 470 as cited in Marriner, 2006).

Literature Review

Since the focus of the current study is restructuring period in teacher education, the first part of the literature review includes the role and the purposes of teacher training. The second part examines the trends in Turkish education and lastly, and finally comparison of self-efficacy sources of science teachers with secondary school education (certificate or diploma) and elementary education departments (with diploma).

The Role and the Purpose of Teacher Training

Three constituents of education, namely student, teacher, and curriculum are in interaction with each other. If one of them was insufficient, this situation could affect the whole system (Ornstein & Hunkins, 1998). The most important component of the educational system is teacher because s/he has the power of affecting other elements (Karagözoğlu, 1987, as cited in Sözer, 1991). Similarly, Kavcar (2002) states that the performance of an educational model basically depends on the quality of the staff, including the teachers and the other personnel working in schools. Therefore, better schools require better teachers.

In order to train high quality educational staff, it is vital to emphasize professional knowledge and professional development which determine both teachers' and students' performance. Teacher performance has been evaluated in terms of the criteria such as classroom management, pedagogy, continuity and consistency, structure and culture of school and the location of school in the context of educational system (Hargreaves, 1993:89 as cited in Tural-Güllaç, p. 11). These quality indicators, in fact, reflect the long-term performance of the educational faculties which train these teacher candidates.

When considering the situation in teacher training before restructuring, a pessimistic picture that reflects significant threats to the quality is encountered. Basic problems that led to the restructuring process were depicted by some writers such as Simsek (2005) and Algur (2002). The basic source of difficulty for teacher training was the unequal importance given to the theory and practice respectively. Excessive emphasis on basic research in educational faculties resulted in ignorance of the fields such as middle school, classroom and early childhood teaching in which the practice and pedagogical dimensions have to get special importance and significance. Another concern was the coordination problems among the institutions. Besides the lack of effective coordination between MONE and educational faculties with respect to teacher training, as a result of ineffective collaboration between educational faculties and art and science faculties, duplication in work outcomes was another frequently encountered problem (Algur, 2002; Simsek, 2005). At that time, inadequate number of graduates from the faculties of education led to increase in certificate programs for which ensuring the quality was not possible (Sözer, 1991; Simsek, 2005).

Besides mentioned concerns, the decision for extending compulsory education to 8 years in 1997 resulted in the need for elementary school teachers.

There were different opinions among educators regarding the implementation. Kavcar (2002) asserts that one of the negative aspects of restructuring is the difference in years of pre-service education for elementary school and secondary school teachers. Prospective elementary teachers are trained in a 4 year study program; whereas this period covers five years for the prospective secondary school subject teachers. Another critique comes from Simsek (2005) about the implementation of 5 years education period in secondary school teaching. According to him, the practice in which the students have to take the courses from the art and science faculties for the first three and a half years of academic period and then they have to continue courses in educational faculties is the weakest aspect of the restructuring. He states that status of the educational faculties' students relative to the students in art and science faculties is problematic. Besides, compared to faculties of education, what puts art and science faculties in a disadvantaged place is the matters related to the usage of classes and/or laboratories and required equipments in courses during the three and a half year education of prospective teachers, although faculties of education generally benefit from financial assistance instead of art and science faculties. Regarding this issue, Kavcar (2002) also states that existing perception of art and science faculties as teacher training institutions for secondary schools did not much change with this practice.

In brief, restructuring shows some limitations and has positive aspects. Teachers have been graduated from faculties of education since 2002, took more teaching profession courses and started teaching experiences at their first year of pre-service education. Thus, it is expected that they feel more competent in their teaching areas, more easily understand elementary school students' cognitive, affective and psychomotor characteristics and their capabilities, feel secure in dealing with classroom management problems. All of these characteristics directly affect teachers' feelings such as self-efficacy beliefs.

Trends in Turkish Education

In 1870, Teacher Training Institute (Darülmuallimin-i Aliye) was established so as to educate teachers for high schools (Üstüner, 2004). From the beginning of the 20th century to 1920, some minor developments were implemented (Karagözoğlu, 1993 as cited in Üstüner, 2004) but the important improvements occurred at the early republic era. One of the most important developments was the acceptance of the teachers' work as a "profession" with the law dated 1924 and number of 439 (Sözer, 1991). In 1932- 1933 academic period, education in teacher training schools was extended to 6 years. Accordingly, first three years in these institutions covered the subjects taught in elementary school and the other three years which was regarded as "professional period" covered the teacher training courses (Akyüz, 1993 as cited in Üstüner, 2004).

By the end of 1930's Village Institutes were founded and the teacher candidates were educated considering various needs of villages. Besides, these prospective teachers also gained various professional practices in the areas such as agriculture and fishing (Baskan, 2001). After 1946, Educational Institutes were established and in 1954 all of the Village Institutes closed. In Educational Institutes, teacher candidates took courses during two years after completing their high school education (Sözer, 1991).

For the 1960's with the law dated 11 October 1960 and number 97, men who graduated from a university and men who drop-out for any reason were allowed to become "spare military officer teacher". With another law 26 July 1963 dated, these people gained a chance to become teachers. Meanwhile, in 1961, all of the secondary school graduates had a right to become contractual teachers (Okçabol, 2005).

In 1970, the length of education was extended to four years in three-year Primary Teacher Training Schools and to seven years in three-year Primary Teacher Training Schools. In 1975 some of the Primary Teacher Training Schools were closed down, and others were transformed into two-year Teacher Training Institutes offering education at the university level (Şimşek & Yıldırım, 2001, p. 416).

In 1978, because of the political clash, academic year in universities could not be completed. This situation resulted in insufficient number of graduates from High School of Education. In order to provide demands for teachers in schools a temporary practice was applied. By this way, individuals with training for one and a half month gained a right to become teachers (Okçabol, 2005, p.78). In 1982 Teacher Training Institutes were converted into two-year Higher Schools of Education and became part of the university system (Şimşek & Yıldırım, 2001, p. 416).

In 1989- 1990 academic year teacher training period was extended to 4 years. With this development, teachers had to opportunity to start their career with undergraduate diplomas (Baskan, 2001).

In 1996-1997, thousands of university graduates from various faculties other than education faculties were appointed as teachers. As another indicator of the absence of effective planning, in 2000, MONE declared that there were not vacant positions for the Mathematics, Physics and Chemistry teachers. As a result, graduates from the departments of Mathematics education, Physics education and Chemistry education at METU and Boğaziçi Universities were appointed as English teachers (Okçabol, 2005). Similar problems aroused with other short-term solutions. To illustrate, after implementing the practice of language teaching at fourth grade, in order to fill vacant teaching positions Germany and French teachers took training for two and a half months in English. Another solution to this problem was assigning classroom teachers who got over score 50 from Examination of State Employees Foreign Language Skills that contained multiple choices questions as English teachers (Okçabol, 2005). The exam totally ignores speaking and writing skills.

Kiraz (2002) interprets the past practices in teacher training as "easy and rapid approaches". Although MONE appreciate teaching as a profession, existing policies led to perception that teaching is a job which could be performed by anybody (Kavcar, 2002).

Self-efficacy sources are effected by experiences. If failure are experienced before self-efficacy construction on a subject, those experiences reasons for undermining self-efficacy (Bandura, 1994). Mastery experiences is one of four sources of self-efficacy and be underline as the most effective one (Bandura, 1994). The second one is Vicarious Experiences. Self-efficacy beliefs are affected by other people's behaviors and reflections, and also our observations on them (Maddux, 2002).

Self-efficacy is affected by experience of early years of profession. According to Bandura (1997) people's self-efficacy beliefs can be measured in prior years of their job experience most effectively, because accomplishments encourage people to develop self-efficacy beliefs while failures result in decreasing in their beliefs. In other words, people's prior experiences are one of the four important sources of self-efficacy information and named as enactive mastery experiences that serve as indicators of capability (Bandura, 1997). The second source is "vicarious experiences" that people can raise their self-perceptions by observing and modeling successful people. The thirds one is "verbal persuasion" and it is related to be encouraged by others (Bandura, 1997). Taking evaluative feedback from successful or important peoples influences one's judgment of self-efficacy. The last one is "psychological reactions". Some indicators like

sweating, heartbeats, mood changes inform people and affect their efficacy assessment (Bilgin, 1996 as cited in Kemer, 2006).

Physical accomplishments, health functioning and coping with stressors are the domains which are listed under the somatic indicators of personal efficacy (Bandura, 1988 as cited in Bandura, 1997). Reducing emotional negative bias and reducing stress level are major way of supporting self efficacy (Bandura, 1997).

Method

Overall Design of the Study

This study was designed to determine the differences between teachers who graduated from elementary science teaching departments after restructuring period and those who graduated from Faculty of Education secondary level physics, chemistry, and biology teaching departments and Faculty of Art and Sciences physics, chemistry and biology departments; who working as science teachers in elementary schools in terms of self-efficacy.

The study is a descriptive study. Descriptive research includes description of already existing conditions. In this type of research, aim is revealing the causes or effects of already existing conditions (Gay & Airasian, 2003).

Participants

In total, 67 women and 60 men voluntarily participated in the study. The rationale for the mentioned years of graduation is related to the common characteristic of the participants is that they are all in the competency building stage in their teaching career cycle. For this reason, they reflect similar characteristics regarding years of teaching experiences. In total 94 Science teachers who graduated with a Pedagogical Formation Certificate means they graduated from Faculty of Arts and Sciences, or Faculty of Education Secondary Schools Physics, Chemistry and Biology Departments. As for Faculty of Education, Elementary School Science Departments graduates, 33 teachers voluntarily participated in.

Data Collection Instruments

As data collection instruments Self-Efficacy Sources instrument was used. The original data-collection tool was developed by Kieffer and Henson (2000) translated in Turkish by Çapa-Aydın, Uzuntiryaki-Kondakçı, Temli ve Tarkın (2013), which consists of 27 seven points Likert type items was used as data collection tool in the study. The reliability of the instrument was calculated by using Cronbach alpha and it varies 0.75 and 0.78 interval based on the factors.

Data Collection Procedures

The data for the study is gathered from elementary school science teachers. Data collection process included the following steps. First of all, to use the instruments, permission was taken from instrument developers and then permission was obtain from MONE. For the second step, data-set was obtained from the participants. In order to reach science teacher graduated from science teaching education and Physics, Chemistry and Biology Teaching Education two different design were used. The authors cannot reach sufficient number of Science Teachers who graduated from Physics, Chemistry and Biology teaching department and are working as Science Teachers. Snowball technique was adopted. All participants gave information about their colleagues working in previous schools or current. Participants who graduated from Elementary School Department Science Teaching Field were reached by using convenient sampling. In other words, Convenient sampling and Snowball techniques were used.

Data Analysis

The participants responded Likert Scale items. Prior to data analysis, procedures of data screening was realized to assess the accuracy of input, amount and distribution of missing data and to identify and deal with the outliers and non-normal variables (Tabachnick & Fidell, 2001).

In total, 67 women and 60 men voluntarily participated in the study. Firstly outliers were controlled. In total of 4 outliers were deleted from data-set. Then normality was examined. If the data-set for a factor and total score for the data collection tool showed normal distribution, parametric tests were used (independent t-test), otherwise, non-parametric tests were used (Mann Whitney U) Results of normality test was presented after Limitation of the Study heading.

Limitations of the Study

Participants' number is the most important limitation of the study. The number of participants who graduated before re-structuring implementation and working as elementary school Science Teachers are limited. Authors cannot reach more participants because naturally their numbers are limited. Data-set did not show normal distribution because of this limitation.

Results

Mastery Experience, Social Persuasion and Physical & Emotional States Factors' values do not show normal distribution (p<0,05). In other words, non-parametric statistical analysis methods are used.

Table 1. Test of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	df	Sig
Total values	.034	127	.200*	.987	127	.306
Mastery Experiences	.095	127	.006	.960	127	.002
Vicarious Experiences	.050	127	.200*	.990	127	.302
Social Persuation	.133	127	.000	.968	127	.002
Physical & Emotional States	.093	127	.008	.973	127	.011

Ho= Data set shows normal distribution. If p-value (significance) higher than 0.05 (p>0,05), Ho is accepted. Normality test results Total Values of the instrument and Vicarious Experience factor p-values higher than 0.05, so these values shown normal distribution. Therefore parametric statistical analysis are used for the total value and Vicarious Experience Factor.

Table 2. Independent Sample T-Test Results based on Graduation Field (Elementary School Science Teachers/Secondary School Education Physics, Chemistry, Biology Education)

		n	*M (Mean)*	Min.	Max.	*SD*	t	p
Total Values	Post re-structure	94	126,28	56	171	20,58	-2,105	0,037*
	Pre-restructure	33	134,88	90	169	19,07		
	Total	127	128,50	56	171	20,48		
Vicarous Experiences	Post re-structure	94	30,76	14	47	7,79	-1,839	0,068
	Pre-restructure	33	33,67	10	48	7,94		
	Total	127	31,51	10	48	7,90		

Graduation year and graduation programs were used as a criterion for distinguish pre-structure and post- restructure graduation teachers. Statistically significant differences were found in total scores of data collection tool (p<0,05). Teachers who graduated from Faculty of Education Science Teaching department had lower total score (M= 126.28) then teachers who graduated from Faculty of Education Chemistry, Physics and Biology Teaching Departments appointed as Science Teachers to Middle Schools (M= 134.88).

Based on Vicarous Experiences Factor scores, statistically significant differences were not found (p>0,05). Although it is not statistically significant, teachers who graduted from Science Teaching Department (M= 33.67) has lower scores then teachers who graduated from Middle Chemistry, Physichs or Biology Departments or Teaching of these scientific areas in faculty of Education (M= 33.67).

Tablo 3. Non-parametric Test

							Mann Whitney U Testi	
		n	Mean	Min	Max	SD	Order *M*	z	p
Mastery Experiences	Post re-structure	94	44,25	21	56	6,46	58,87	-2,916	0,004*
	Pre-restructure	33	48,06	33	56	6,59	80,70		
	Total	127	45,23	21	56	6,68			
Social Persuation	Post re-structure	94	24,37	9	35	5,82	58,84	-2,937	0,003*
	Pre re-structure	33	27,48	15	34	5,12	80,80		
	Total	127	25,17	9	35	5,80			
Physical & Emotional States	Post re-structuring	94	26,91	11	42	7,06	65,42	-0,477	0,633
	Pre-restructuring	33	25,67	10	40	9,12	61,85		
	Total	127	26,59	10	42	7,62			

Mastery Experiences Factor shows statistically significant differences (p<0,05). Middle School Science teachers who naturally graduated after re-structuring in education have (M= 44.25) statistically significantly lower mean score then science teachers who took Chemistry, Biology or Physics Education in Science and Art Faculties or Faculty of Education (M= 48,06).

Graduation type's effect on Science Teachers on Social Persuasion Factor show statistically significant differences (p<0,05). Social Persuasion score of post structure graduates (M= 24,37), statistically significantly lower then pre-structure graduates (M= 27,48).

Pre and post structure graduates Science Teachers do NOT show any statistically significant differences (p>0,05).

Discussion and Conclusion

Mastery Experiences Factor shows statistically significant differences (p<0,05). Middle School Science teachers who naturally graduated after re-structuring in education have (M= 44.25) statistically significantly lower mean score then science teachers who took Chemistry, Biology or Physics Education in Science and Art Faculties or Faculty of Education (M= 48,06). Science teachers who graduated from Elementary School Science Teaching Departments took more pedagogical courses like Classroom Management, Field Experience Courses. Providing students' participation, efficacy in teaching strategies and classroom management are factors of teaching self-efficacy (Çapa, Çakıroğlu & Sarıkaya, 2005). Classroom management course added teacher training programs after re-structure in teacher education programmes. Students' participation and enhancing students' motivation to actively join in activities, using effective teaching strategies are among subjects of educational sciences. That's why, graduation from Elementary School Science Teaching Departments is expected to have higher scores. In contrast to this study, Arastaman (2013) found Faculty of Education students have higher scores on attitudes towards teaching profession than Faculty of Arts and Sciences. In detail, Arastaman (2013) conducted a study to compare senior students of Art and Sciences Faculties in Ankara city with senior students of Faculty of Education. Attitudes towards teaching profession had statistically significant higher scores then senior students of Art and Sciences Faculties who have a chance of being teachers but they have to take Pedagogical Formation Courses. This results can be explained as the positive effect on educational courses. Results also show that attitudes towards teaching profession is not a predictor for self-efficacy perception.

Pedagogical Formation students have high scores on teaching self-efficacy (Çocuk, Yokuş, & Tanrıseven, 2015). The same participants draw their metaphors on pedagogical formation education. Metaphors related to "money taken from students", "concept of obligaton", "preparation" concepts. The results of this study shows participants face some limitations but they perceive formation process as a way for finding a job. Pedagogical Formation Courses are covered in almost 14 weeks, although Faculty of Education graduates' one term is 14 weeks means they have time to cover the courses in-detail. This

result underlines that "to what extent teachers trained as sufficient teacher during pre-service education does not means teachers' or teacher candidates' perceptions about their competencies.

According to Üstüner, Demirtaş, Cömert & Özer' (2009) study, graduation department do not affect teachers' self-efficacy perceptions in a statistically significant way. This finding is opposite of this study's finding. The reason might be related to participants' teaching fields, undegraduate education or participant size.

The results showed that experiences is perceived as more effective than teacher training process. Although pedagogical formation certificate program lasts 7 weeks, the participants who participated in the study have the training during 3 semesters; therefore high self-efficacy may result in sufficient process. Conducting comparison studies with different teacher training process graduates can be suggested for further studies.

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