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Pre-Service Primary School Teachers' Motivations for Choosing the Teaching Profession and Their Self-Efficacy Beliefs in Science Teaching

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Abstract

In the literature, pre-service primary school teachers' low levels of self-efficacy in science and science teaching are frequently expressed. Self-efficacy beliefs of pre-service teachers have a major role in future teaching practices and have a reciprocal interaction with their motivational beliefs. This study researched pre-service teachers' motivation to choose the teaching profession and their science teaching self-efficacy. Participants consisted of 181 pre-service primary teachers at a university in the Western Black Sea Region of Turkey. The 'Science Teaching Efficacy Belief Instrument' (STEBI-B) and the 'Motivation Scale for Profession and Field Selection'(MSTPFC) were used for this research. The study was conducted in the 2013-14 and 2014-15 academic years. The results indicate that intrinsic motivation correlated positively to the student's proficiency perception in their own science teaching. The study has shown how these characteristics positively contribute to the preparation of primary teacher candidates' competencies in terms of self-sufficiency, motivation, self-confidence, interest, need, and belief.

INTRODUCTION

In the scope of science teaching in Turkey, it is now expected that primary teachers create a teaching environment that encourages their students to be more active in their participation in the learning process (MoNE, 2018). Moreover, teachers are also expected to seek alternative and creative ways to improve their students' performance. The newly established Turkish science curriculum for primary school states the teacher's role as:

... the integration of science with mathematics, technology, and engineering is aimed to enable students to look at problems from an interdisciplinary point of view. In this context, the role of teachers is to guide pupils to integrate science, technology, engineering, and mathematics. In this way, it is expected that students achieve high-level thinking, product development, invention, and innovation. (MoNE, 2018, p. 10)

According to the TIMSS-2015 results, Turkish fourth-grade students could not communicate and apply scientific knowledge of life, physical, and earth sciences to their everyday experiences nor could they understand abstract concepts. In addition, these students were insufficient in demonstrating knowledge of scientific inquiry (Yıldırım, et al. 2016). To meet the Ministerial expectations and address students' low achievement in science, qualified

teachers are required with the necessary skills in both science teaching and their own science subject matter knowledge.

In contrast to some higher-income countries, in developing countries such as Turkey, the quality of teachers was found to be one of the most influential factors in the achievement of primary school students (Heyneman & Loxley, 1983; McEwan, 2015). Therefore, the importance of investigating those teacher characteristics that might be influential on the successful fulfilment of their teaching duties has been reported (Klassen & Tze, 2014). The successful fulfilment of a task, duty, or assignment depends on the self-efficacy, motivation, and self-confidence of both the students and teachers. The effects of these factors on achievement, attitude, and professional choice have been examined (Anderson, et al., 1988; Boz & Boz, 2010; Morris, et al., 2017; Özbaş, 2014). Given the positive effect of self-efficacy and motivation on increasing success (Klassen & Tze, 2014; Yazıcı, 2009), teachers should have a high level of self-efficacy and motivation for the successful fulfilment of their tasks. In particular, with their role of facilitating the learning process, one might expect teachers to have high self-efficacy perceptions concerning their teaching knowledge (Bandura, 1997) and high professional motivations (Atav& Altunoğlu 2013).

Research has noted that a strong predictor of behaviors in competent teachers is their self-efficacy (Boz & Boz, 2010; Palmer, et al., 2015). In addition to self-efficacy, a teacher's motives for choosing the teaching profession are important since self-efficacy beliefs and motives have a reciprocal interaction. The motives of an individual are influenced by their beliefs regarding their own capabilities in addition to their interests and aims (Seifert & Sutton, 2010). On the other hand, individuals who are intrinsically motivated to choose the teaching profession have reasons based on their own interests, joy, or inherent contentment (Ryan & Deci, 2000). As such, are intrinsically motivated pre-service teachers more enthusiastic about developing their teaching skills during their teacher education? Is there a measurable relationship between intrinsically or extrinsically motivated teachers with their self-efficacy beliefs in teaching? While Klassen and Tze (2014) argued that there should be studies aimed to uncover links between motivation beliefs and job performance, this current study focused on whether there existed a relationship between student teachers' motives for their career choice and their self-efficacy beliefs. However, as Bandura (2006) stated, there is no all-purpose of measure of self-efficacy beliefs since it limited the explanatory and predictive power of research. He explained this assertion as such:

> *One cannot be all things, which would require mastery of every realm of human life. People differ in the areas in which they cultivate their efficacy and in the levels to which they develop it even within their given pursuits* (Bandura, 2006, p. 307).

From this point of view, researching pre-service primary teachers' beliefs in general teaching self-efficacy could be issued as a limiting factor since they teach their students a variety of contents, such as grammar, mathematics, science, social studies, etc. To escape from this limiting factor, more specifically, primary teachers' self-efficacy beliefs in science teaching should be researched since the studies have reported that many primary teachers have difficulties in science (Bursal, 2010; Koc & Yager, 2016; Martinez Torregrosa, et al., 2018; Palmer et al., 2015; Wang, et al., 2015). For instance, Buss (2010) indicated that pre-service primary teachers' teaching efficacy was lower for science and mathematics than for other curriculum subjects. Similarly, Tosun (2000) reported that some primary teachers had difficulties in teaching science while others were afraid of this subject.

As mentioned above, teacher education is one of the most effective factors in Turkish educational output therefore, recruitment of appropriate individuals for the teaching profession is critical. In Turkey, teachers study at a Faculty of Education. The student selection for universities is administered countrywide by a single central examination system. Primary teacher training programs require a minimum examination score. This score is comprised predominantly of the mathematics, social sciences, and Turkish (literature and grammar) sections of this exam. The contribution from the science component is limited. As a result, most of the students who select primary teacher training focus their preparation on the more dominant sections of the exam. During their teacher training study, however, primary teacher program students have to take science and science education courses.

In contrast to many higher-income western countries, in Turkey, the teacher shortage is less prominent as students continue to prefer teaching as a career (Özdoğan Özbal & Gökçe, 2018). Students are applying to the various teacher-training programs even though there are numerous graduates still waiting for employment by the Minister of National Education (Kılınç, Watt, & Richardson, 2012). One reason for this persistent demand for teacher education might be the job security offered by the teaching profession. In many developing countries, being a teacher has emerged as an option for young people from lower-income families (Mooij, 2008; Stromquist et al., 2013). Kılınç et al. (2012) pointed out that most teacher candidates in Turkey come from middle to low-socioeconomic-status backgrounds. While this career provides a low income, it does provide a high level of job security. Because of this job security, it seems that in Turkey not all the individuals choosing teacher-training programs may have done so for intrinsic reasons. In accordance with this, Özdoğan et al. (2018) stated that the recruitment policies of Turkey reduce the quality of teachers since it affects directly the vocational motivations of teachers. As such, the career choice motives and self-efficacy beliefs of pre-service primary teachers may be questionable.

In this regard, the aim of the present study was to examine the correlation between pre-service primary teachers' motivations for their choosing the teaching profession and their self-efficacy in science teaching.

Self-Efficacy Beliefs and Motivation for Choice of Teaching Profession

Self-efficacy beliefs are based on Bandura's social cognitive theory (Bandura, 1997). According to Bandura, people perceive themselves as either competent or incompetent to be able to achieve a course of action and therefore they hold some beliefs about their own self-abilities. This belief about self-ability is one's own personal efficacy, in addition, the beliefs about one's expectations regarding the desired results are known as outcome expectancy (Bandura, 1997). As a result, an individual's beliefs about their own self-abilities determine their self-efficacy (Bandura, 1977a, 1977b).

In the education domain, self-efficacy can be explained as a teacher's personal belief in their competence to execute teaching tasks at a particular level of quality in a classroom environment (Rouweler, 2016). In the scope of the teaching profession, as a personal trait, self-efficacy has been widely evaluated. In previous studies, both pre-and in-service teachers' commitment to the teaching profession, their students' achievement, the quality of their teacher-student relationship, teacher training, student teachers' academic achievement etc. have been investigated in relation to self-efficacy (Chesnut & Burley, 2015; Klassen & Tze, 2014; Martins, et al., 2015; Zee, et al., 2017; Tomšik, 2019).

It should be noted that not all science courses or research interventions have had a positive influence on self-efficacy beliefs in science teaching (Cakiroglu, et al, 2012). Specifically, Woolfolk Hoy, et al. (2009) asserted that the self-efficacy of teachers was more or less resistant to change because their self-efficacy had already been shaped. Additionally, Bergman and Morphew (2015) have stressed that one should not attribute statistically significant differences between pre-and post-survey science teaching self-efficacy beliefs solely to educational treatment, other lurking variables should be considered, especially, the diversity of participants' backgrounds. In this scope, the motivation regarding the choice of teaching profession would be influential on self-efficacy beliefs, since motivation regarding the choice of teaching profession would shape one's career track. For instance, individuals, who are motivated intrinsically to choose the teaching profession, would be more enthusiastic to develop their abilities and knowledge in subject matter and teaching. Based on their research, Watt and Richardson (2008) found that the motivation to teach, beliefs about the profession, and satisfaction with career choices were closely linked to the pre-service teachers' professional commitment and career development desires. In this context, the studies subjected to investigate the students' motivations, which were relevant to the choice of the teaching profession, are reviewed. For instance, Çermik, et al. (2010) stated that pre-service primary teachers' reasons for teacher training were shaped firstly by mercenary reasons, secondarily extrinsic, thirdly intrinsic, and finally altruistic reasons. Those authors defined the mercenary reasons in the context of economic benefits and working conditions. The reasons for normative characters such as "family demands to choose teaching as a career" or "prestige of teaching profession in society", were grouped by authors under extrinsic reasons. In the same manner, Kiziltepe (2015) analyzed student teachers' responses to the question "what is your primary motivation for choosing teaching as a career?" and reported: altruistic motivations (a worthwhile profession or career, helping children, and positively impacting upon their lives) had a response rate of 37%; extrinsic motivations (stable salary, immediate job, positive work climate) had a response rate of 31%; and, intrinsic motivations (personal satisfaction and improvement, getting a good education) had a response rate of 18%. From these results, it would appear that Turkish teacher candidates are motivated more by altruistic and extrinsic reasons. In contrast to Kiziltepe (2015), One-quarter of Ozturk Akar's (2012) participants in her study on the motivation of pre-service teachers for choosing the teaching profession claimed that if their university entrance exam scores had been higher, they would have chosen a different career. In the Turkish context, the career choice of some individuals appears to be influenced by external factors. Although altruistic reasons are mentioned by studies as one of the reasons for choosing the teaching profession, such motives are valid not only for the teaching profession but also for other Turkish public service related professions. Therefore, this study's focus was only on intrinsic and extrinsic reasons.

In Turkey, there have been studies regarding motivation on choosing primary teacher as a career, but there has been no study that researches teaching career motivation in relation to self-efficacy beliefs in science teaching. It is especially important to remember that many primary school teachers demonstrate low self-efficacy in science teaching (Palmer et al., 2015) and therefore this tendency should be investigated regarding the reasons for these teachers' selection of the teaching profession. Thus, this study aimed to investigate pre-service classroom teachers' self-efficacy in science teaching and their motivation for choosing to become a teacher. The study's research questions were as follows:

1. How do pre-service primary teachers' motivation to choose the teaching profession vary?
2. How do pre-service primary teachers' self-efficacy beliefs in science teaching vary?

3. What is, if any, the relationship between pre-service primary teachers' motivation to choose the teaching profession and their self-efficacy beliefs in science teaching?

METHOD

Study Design

This research was designed on the fact that the motivations for choosing the teaching profession may also have a reciprocal relationship with the teacher's self-efficacy beliefs in science teaching which has been seen as a problematic issue regarding primary teacher candidates. In order to investigate this phenomenon, this study applied a descriptive research model in a quantitative manner.

Study Group

The research involved 181 third-year pre-service teachers studying primary teaching at a university in the Western Black Sea Region of Turkey. Measurement tools were administered at the end of the science teaching courses during both the 2013-14 and 2014-15 academic years. Table 1 presents the demographic characteristics of pre-service classroom teachers participating in the research. For both participating student teacher cohorts, the structure of their training program and the university entrance system was identical. Before conducting the research, the ethical aspect of the study was confirmed by faculty management. All participants were made aware that participation in the study or withdrawal at any time was at their own discretion
Students who successfully completed science courses and science teaching courses were selected for the study: General Biology, General Chemistry and General Physics. Each science course was taught for two hours per week for one semester (14 weeks). The General Biology and General Chemistry courses were offered in the first year of this primary teacher-training program. The General Physics course was offered in the second year. The science-teaching course was delivered over three hours per week for both semesters of the third year. In this programme, the student teachers must complete the science content component of the programme before undertaking the science teaching component. The data collection of the current study was conducted after the student teachers had successfully completed their science teaching course.

Table 1. Demographic characteristics of the study group

Variables	Categories	(%)
Gender	Female	77
	Male	23
Type of high school attended	General High School	54
	Anatolian High School	46
Mother's educational status	Primary School	75
	Lower-secondary School	9
	Upper-secondary School	11
	University	5
Father's educational status	Primary School	40
	Lower-secondary School	13
	Upper-secondary School	24
	University	23

	2.0-2.5	11
GPA	2.6-3.0	44
	3.1-3.5	36
	3.6-4.0	9

It is tought that the demographical characteriscs of the study group appopitrates with the aimns of the research as seen at Table 1.

Data Collection Tools

A three-part measurement tool was used. The first part of the measurement tool gathered demographic and personal information from each pre-service primary teacher to include: gender, type of high school graduation, and their academic average (GPA). The second part of the measurement tool included the 'Motivation Scale on Teaching Profession and Field Choice' (MSTPFC) to identify each pre-service teacher's motivation for choosing the teaching profession. The final part involved the 'Science Teaching Efficacy Belief Instrument' (STEBI) to determine each pre-service teacher's self-efficacy.

Riggs and Enochs (1990) developed the 'Science Teaching Efficacy Belief Instrument' (STEBI-A) in order to measure in-service primary teachers' self-efficacy beliefs in science teaching. This scale was constructed as context-specific and subject matter in accordance with Bandura's theory of self-efficacy and is a 5-point Likert-type scale. Enochs and Riggs (1990) modified the STEBI-A into STEBI-B which was appropriate for primary teacher candidates. The STEBI-B form consists of two subscales: Personal Science Teaching Efficacy Belief Scale and Science Teaching Outcome Expectancy Scale.

The modified STEBI-B was translated into Turkish by Bıkmaz-Hazır (2002). The internal consistency of subscales of the Turkish STEBI-B was calculated at .86 (.71 for the current study) for the Efficacy Belief Scale and .69 (.60 for the current study) for the Outcome Expectancy Scale (Bıkmaz-Hazır, 2002). The 'Motivation Scale on Teaching Profession and Field Choice' (MSTPFC) developed by Mayr (1998) was adapted for the Turkish population by Atav and Altunoğlu (2013). A pilot study of this scale was conducted with two separate groups consisting of 587 teacher candidates. In this pilot study, both explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. According to the results of EFA, it was determined that the scale consists of four subscales: Intrinsic Reasons for Profession Choice (IRPC), Intrinsic Reasons for Field Choice (IRFC), Extrinsic Reasons for Profession Choice (ERPC), and Extrinsic Reasons for Field Choice (ERFC). The structure of the instrument with four subscales was confirmed according to CFA results. Fit index values were found as follows: GFI=.90, AGFI= .87, NNFI= .95, CFI= .96, RMSR= .091, SRMSR= .061, and RMSEA= .064. This scale is a 5-point Likert type.

Data Analysis

Mean and standard deviation values were used in the description of continuous data obtained through the MSTPFC and STEBI. The categorical data for the study group was presented under two different categories: socio-demographic (gender, settlement unit, parental occupation, and income) and academic (type of upper-secondary school and GPA).

The multivariate analysis of variance (MANOVA) was used in the analysis of the dependent variables obtained through the Motivation Scale and STEBI in terms of socio-demographic and academic independent variables. The Pearson correlation coefficient was calculated for the

determination of the correlation between the self-efficacy perception of science teaching and the choice to pursue the teaching profession.

FINDINGS

This study examined pre-service classroom teachers' motivations for choosing the teaching profession and their self-efficacy in science teaching.

Results Regarding the Reasons for the Choice of the Teaching Profession

As seen in Table 2, female pre-service teachers demonstrated the highest proportion in terms of their intrinsic reasons for choosing their profession and field, while male pre-service teachers were more prominent in terms of their extrinsic reasons.

Table 2. Analysis of the subscale scores of the MSTPFC

Variables		Factors							
		IRFC		IRPC		ERPC		ERFC	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Gender	Female	4.12	.76	4.39	.56	2.95	.88	3.64	.88
	Male	3.80	.79	4.00	.88	3.01	.88	3.79	.89
Mother's educational status	Primary school	4.06	.77	4.29	.65	3.71	.86	2.98	.90
	Lower-secondary	3.91	1.01	4.46	.59	3.69	1.05	2.85	.86
	Upper-secondary	3.97	.64	4.30	.63	3.45	.91	2.88	.81
	University	4.17	.65	4.19	.82	3.53	.98	3.13	.76
Father's educational status	Primary school	4.10	.75	4.33	.65	3.67	.94	2.97	.92
	Lower-secondary	3.99	1.04	4.46	.64	3.67	.92	2.82	.94
	Upper-secondary	3.92	.81	4.23	.62	3.83	.85	3.06	.82
	University	4.12	.58	4.23	.69	3.52	.80	2.92	.84
GPA	2.0-2.5	4.05	1.06	4.33	.65	3.56	1.25	2.90	1.12
	2.6-3.0	3.93	.72	4.20	.63	3.62	.86	2.90	.83
	3.1-3.5	4.19	.65	4.40	.54	3.75	.80	3.09	.88
	3.6-4.0	4.02	1.00	4.31	1.03	3.78	.83	2.82	.80
Type of high school attended	General high school	4.16	.67	4.40	.55	3.72	.94	2.94	.96
	Anatolian high school	3.92	.86	4.18	.74	3.61	.81	3.00	.77

MANOVA was used to determine any differences in the motivation for the selection of profession and field according to demographic variables. Box's M test was performed for the variance-covariance equation, and the sample was found to be appropriate for the analysis (Box M = 116.730 p> .05). According to the result of MANOVA, Wilks' λ was λ= 0.905 $F_{(4, 102)}$ =

2.665 p< .05, the partial eta squared = .095 for the variable gender, Wilks' λ= .812 $F_{(12, 270)}$ = 1.846 p < .05, and the partial eta squared = .067 for the variable GPA, and Wilks' λ= .641 $F_{(12, 270)}$ = 4.126 p < .05, with the partial eta squared = .138 for the interaction of the variables gender and GPA. Accordingly, there were statistically significant differences in the pre-service teachers' reasons for selecting their profession and field in terms of gender, GPA, and the interaction of both variables. A follow-up analysis was conducted to determine which subscale/subscales demonstrated differences in profession and field choice according to gender. The analysis results are presented in Table 3.

Table 3. Results of ANOVA concerning the follow-up test

Source	Dependent variables	*df*	KO	*F*	*p*	Partial η^2
Gender	**IRFC**	**1**	**2.670**	**5.432**	**.022**	**.049**
	IRPC	**1**	**2.630**	**10.047**	**.002**	**.087**
	ERFC	1	.080	.097	.756	
	ERPC	1	.055	.076	.783	
GPA	IRFC	3	.429	.873	.458	
	IRPC	**3**	**0.858**	**3.280**	**.024**	**.086**
	ERFC	3	.346	.420	.739	
	ERPC	3	1.665	2.293	.082	
Gender*GPA	IRFC	3	1.311	2.668	.051	
	IRPC	**3**	**2.256**	**8.619**	**.000**	**.198**
	ERFC	3	.792	.962	.414	
	ERPC	**3**	**3.172**	**4.368**	**.006**	**.111**

As seen in Table 3, gender was a source of difference between pre-service teachers in terms of IRFC and IRPC scores. However, given the values of η^2, it is clear that this difference has a low effect value. According to the results of the follow-up test concerning the variable GPA, this independent variable serves as a source of difference in pre-service teachers' IRPC scores, and the effect value of this difference is low. The interaction of the variables of gender and GPA was a source of difference in IRPC and ERPC scores, and the effect size was low based on η^2 values. The statistically significant interaction between the variables of gender and GPA indicated that the effect of GPA varies by gender. Therefore, the variation of IRPC and ERPC scores affected by the interaction of both independent variables was examined through graphs.

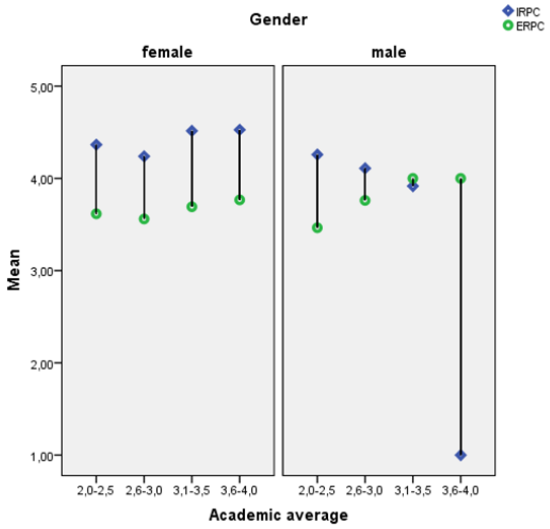

Figure 1. The variation of IRPC and ERPC scores by GPA among female and male pre-service teachers

Figure 1 shows the variation of intrinsic and extrinsic reasons for the profession choice of female and male pre-service teachers according to GPA; as the GPA increased, IRPC scores increased in female pre-service teachers, whereas ERPC scores increased in male pre-service teachers.

Results Regarding Self-Efficacy in Science Teaching

Table 4 shows the variance of pre-service teachers' scores of the STEBI by gender, GPA, and type of high school from which the participant graduated.

As seen in Table 4, the scores of the STEBI subscales vary by gender and GPA. MANOVA was used to determine whether this difference is statistically significant.

Table 4. Results of STEBI according to gender and academic variables

Variables		STEBI Subscales			
		Efficacy Belief		Outcome Expectancy	
		M	*SD*	*M*	*SD*
Gender	Female	3.45	.40	3.68	.46
	Male	3.38	.37	3.68	.37
GPA	2.0-2.5	3.34	.43	3.74	.49
	2.6-3.0	3.42	.40	3.64	.46
	3.1-3.5	3.46	.38	3.69	.42
	3.6-4.0	3.50	.43	3.72	.39
Type of Upper-secondary School	General high school	3.45	.38	3.66	.47
	Anatolian high school	3.42	.41	3.70	.41

According to the results of MANOVA, Wilks' λ was λ= .989 F(2, 165) = .904 p > .05 for the variable gender, λ= .983 F(2, 330) = .466 p > .05 for GPA, and λ= .997 F(2, 165) = .283 p > .05 for the type of upper-secondary school from which the participant graduated. Accordingly,

there was no significant difference in the pre-service teachers' scores from the STEBI subscales with respect to the independent variables.

Results Regarding the Correlation Between MSTPFC and STEBI Scores

The relationship between pre-service teachers' self-efficacy in science teaching and their reasons for their choice of the teaching profession was determined to calculate the coefficients of the correlation between the Subscales of the Motivation Scale and STEBI. The correlation coefficients are presented in Table 5.

Table 5. Correlation Coefficients between the Subscales of the Motivation Scale and STEBI

Correlation Coefficients		
	Efficacy Belief	Outcome Expectancy
IRFC	.367**	.147*
ERFC	.013	.155*
IRPC	.175*	.153*
ERPC	.025	.198**

** Correlation was significant at .01
* Correlation was significant at .05

As presented in Table 5, a positive significant correlation was found between the IRFC and IRPC scores of the Motivation Scale on the one hand and the Efficacy Belief scores of the STEBI on the other.

DISCUSSION

The present study examined the effects of variables on pre-service teachers' motivation for the selection of the teaching profession and their self-efficacy in science teaching. The parents' educational background, one of the independent variables, was evaluated in relation with motivation to choosing the teaching profession, while academically relevant variables such as GPA and type of upper-secondary school were assigned as the independent variables were interpreted with self-efficacy beliefs in science teaching. It also examined the relationship between their reasons for their profession choice and science teaching self-efficacy.

According to the results, a significant difference was found in the selection of the teaching profession and primary teaching as a specific teaching field in terms of gender and GPA and the interaction of the two variables. By examining the subscales of the Motivation Scale with respect to gender, the study revealed a significant difference with a low effect size in the dependent variables of IRFC and IRPC (see Table 3). Considering the mean scores of the Motivation Scale, the female pre-service teachers' intrinsic reasons for their profession and field choice were significant in the selection of primary teaching. These subscales demonstrated that the variable of GPA was a source of significant difference, with a low effect size present only in IRPC scores. The variables of gender and GPA together seem to be a source of significant difference, with a low effect size in both IRPC and ERPC scores (see Table 3). It is suggested that further studies be carried out with wider participant groups because the effect size of the differences discovered in the analysis is small. However, the analysis performed in this study may contribute to future research.

The research results revealed that female participants intentionally selected primary teaching as a future profession and achieved high GPAs in their studies. Among male pre-service teachers, as their GPA increased, their extrinsic reasons for profession choice appeared to become more

evident. This result could be explained by the fact that in Turkey primary teaching is specifically associated with women. Male pre-service teachers who were academically successful may demonstrate hesitation to commit to a career in the field because of social factors such as potential employment and appointment. Female pre-service teachers were more likely to demonstrate high motivation to engage in their profession as a result of the combination of inner satisfaction and academic achievement. However, it seems less likely for male pre-service teachers to engage in their profession with high motivation, even if they attain academic achievement. Previous research has also revealed similar results in that female pre-service teachers choose the teaching profession for altruistic reasons that could be regarded as intrinsic reasons, while male pre-service teachers prefer it for more extrinsic reasons (Yüce, et al., 2013). Therefore, it can be suggested that male pre-service teachers are subjected to orientation training for such situations in the pre-service period. Liu and Onwuegbuzie (2014) have suggested that the selection of teaching profession for intrinsic reasons influences professional satisfaction in both developing and developed countries, and thus the motivation of student teachers and prospective teachers as well as their qualifications should be taken into account. Agbaria (2013) has researched the level of decisiveness the participants demonstrated when choosing their profession and found a low positive relationship between self-determination in choosing a profession and academic motivation. This perspective suggests that career choices are driven by intrinsic motivation and the tendency to make positive contributions both during the pre-service education period and during the in-service period. This positive contribution is likely to manifest itself in people's self-efficacy beliefs, both in their academic and professional careers.

The results concerning the science teaching self-efficacy of the participant pre-service teachers indicate no significant difference with respect to independent variables. Accordingly, there should be no expectation of a difference regarding science teaching in terms of independent variables such as gender, GPA, and type of high school attended, and the training of pre-service teachers should be structured accordingly.

Self-efficacy has an effect both on professional satisfaction in teaching and on professional attendance and continuity during the participants' in-service period (Klassen & Chiu, 2010; Chesnut & Burley, 2015). Thus, the present study examined pre-service classroom teachers' self-efficacy in science teaching and their motivation to choose a teaching profession and considered these factors together. Upon observing the relationship between participants' self-efficacy and reasons for profession choice, significant relationships were found in some of the subscales. A positive but weak relationship was discovered between the intrinsic motivations for the choice of classroom teaching profession and field and science teaching efficacy beliefs (see Table 5). A positive but weak correlation was observed between the participants' intrinsic reasons for their field choice and the science teaching efficacy beliefs as well as a weaker positive relationship between the intrinsic reasons for profession choice and efficacy beliefs (see Table 5). These results point to the assertion that participant pre-service teachers who take into account their intrinsic reasons to select their profession and field perceive themselves as more qualified for their required performance during training. This finding is likely to be reflected in their working life. However, it should also be noted that there was no significant relationship between their extrinsic reasons for their profession and field choice and their efficacy beliefs. Thus, when pre-service teachers prefer the teaching profession for intrinsic reasons, it seems more likely that they will be efficacious in their science teaching practice.

The outcome expectancy subscale of the STEBI showed a positive and statistically significant but weak correlation with both the intrinsic and extrinsic reasons for profession and field choice

on the MSTPFC. Based on these results, it is expected that pre-service teachers who have chosen to become teachers for intrinsic reasons have greater beliefs that they will obtain positive results from science teaching. However, pre-service teachers who take into consideration extrinsic reasons do not demonstrate positive outcome expectations for science teaching. This finding may indicate that those in the latter group, on the one hand, do not perceive themselves as possessing sufficient knowledge of science (no correlation was found between efficacy belief and extrinsic reasons for profession and field choice), while on the other hand, they have positive beliefs that their training and education in science will somehow yield positive results. It may also indicate the pre-service teachers' belief that they have the knowledge of science necessary for primary school-level teaching, although they do not have sufficient knowledge of the field.

In terms of given the results above, summarily, it may highlight that there is a gender difference in their motivation to become a teacher, and also, this difference is not observed in science teaching self-efficacy. However, there is a need for further research on pre-service classroom teachers and their perceptions of the basic concepts of science they will be responsible for teaching.

CONCLUSION AND IMPLICATIONS

The evidence indicates that the career choice motivation of female primary teacher candidates is shaped more intrinsically. These results could be expected due to the social structure of Turkey. Like many other developing countries, in Turkey, more women are oriented in the teaching profession than in many other professions. Other relevant results of the research are related to academic achievement and gender in relation to profession choice motivation. In contrast to female candidates, as the academic achievement gets higher, male teacher candidates' motivation is oriented more extrinsically. Certainly, this gender contrast could be attributed to this study's group of student teachers. Therefore, a further study that seeks to research this gender contrast in academic achievement and profession choice would be suggested. One of the relevant results is the relationship between the career motivation of primary teacher candidates and their self-efficacy belief in science teaching. Considering the issues regarding self-efficacy beliefs in science teaching of primary teacher candidates in the literature, intrinsically motivated teacher candidates are more confident in science teaching efficacy. From this view of point, an interview is suggested during the selection of the students for teacher training recruitment in order to select more intrinsically motivated individuals.

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