SAKARYA UNIVERSITY JOURNAL OF EDUCATION
Original Research Doi: 10.19126/suje.1108158
Received: 24.04.2022 Accepted: 05.09.2022
Published: 15.12.2022 December 2022• 12(3) • 591-611

The Relationship between Academic Motivation Types and Learning Styles of Pre-service EFL Teachers*

Derya UYSAL**

Abstract. This study was conducted in order to investigate the potential relationship between learning styles and academic motivation types of pre-service teachers in the English Language Taeching (ELT) department. 198 pre-service teachers enrolled in the ELT department of Alanya Alaaddin Keykubat University, a state university in Turkey, took part in the study. Data of the study were gathered via two research instruments: Academic Motivation Scale and Learning Styles Inventory III. Expected relationships in the research questions were tested via Chi square test analysis in SPSS. Results revealed a significant relationship between gender and academic motivation types as well as gender and learning styles of pre-service EFL teachers. However, although year levels, grades of pre-service EFL teachers were in a relationship with their academic motivation types, no significant relationship between year levels and learning styles of pre-service teachers was found. Last, a significant relationship between academic motivation types and learning styles of pre-service EFL teachers was revealed.

Keywords: Pre-service EFL teachers, Experiential learning theory, Learning style, Motivation, Self-determination theory.

* Ethical approval was obtained from Alanya Alaaddin Keykubat University Social and Human Sciences Scientific Research and Publication Ethics Committee with decision number 08/19 and dated 11.11.2021.

** Orcid ID: https://orcid.org/0000-0001-5393-5211, Dr., Department of Foreign Languages, Alanya Alaaddin Keykubat University, Turkey, dkorucu@gmail.com

Uysal, D. (2022). The Relationship between Academic Motivation Types and Learning Styles of Pre-service EFL Teachers. *Sakarya University Journal of Education, 12*(3), 591-611. doi: https://doi.org/10.19126/suje.1108158

1. INTRODUCTION

Despite the existence of different theories that divide motivation into various categories, Self-determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2000) is distinctive in terms of interpreting the motivation. The theory puts forward that there are three needs that should be met for individuals. These basic needs are autonomy, relatedness, and competence. Fullfilling these needs is necessary for individuals' well-being because in case these three needs are satisfied, individuals adopt autonomous motivation toward a phenomenon. On the other hand, if these needs are not satisfied, people adopt controlled types of motivation or amotivation toward the same phenomenon. To put it another way, the more these needs are fulfilled, the higher motivation an individual develops toward a certain phenomenon. According to Self-determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2000), motivation could be defined as a continuum and motivation types are placed along this continuum considering the degree of autonomy. Amotivation is placed along the left end of the motivation continuum, and this type of motivation represents absence of intentional regulation. On the other hand, extrinsic motivation is classified into four categories. First, externalized regulation represents controlled motivation and appears in case of reward and punishment. Second, introjected regulation represents moderately controlled motivation while the third type that is identified motivation represents moderately autonomous motivation. Fourth category is the integrated regulation which is autonomous, but appears, in case of coherence between goals, values, and regulation. Intrinsic motivation is placed along the right end of the motivation continuum, and it represents inherently autonomous regulation. Intrinsic motivation appears in case individuals get pleasure in tasks they are involved in (Deci & Ryan, 2000; Ryan & Deci, 2000).

Research results driven by two decades of empirical work on Self-determination Theory prove that intrinsic motivation is in a relationship with a number of positive outcomes. Teaching profession is no exception and compared to their extrinsically motivated counterparts, intrinsically motivated teachers are more likely to produce adaptive outcomes in teaching (Koludrović & Ercegovac, 2015; Vasconcellos et al., 2020). The evidence proving the relationship between intrinsic motivation and the positive outcomes comes from various past studies. For example, findings of some previous studies gave evidence on the positive correlation between competence in teaching and intrinsic motivation (Kaldi & Xafakos, 2017; Taylor et al., 2008; Wang & Liu, 2008). It seems more likely that when teachers adopt a high level of autonomous motivation, they have a greater tendency to look for ways yielding to active engagement, so they feel related to their students and colleagues. Besides, they feel competent when teaching, and autonomous in deciding their actions (Taylor et al., 2008).

Results of earlier studies demonstrated that teachers having intrinsic motivation toward the profession feel more competent as well as more satisfied while teaching. Additionally, they develop higher self-esteem. As a consequence of these positive feelings, they spend longer time in the profession (Bruinsma & Jansen, 2010; Özder & Motorcan, 2013). Additionally, teachers that are intrinsically motivated toward teaching

and feel competent influence students' motivation for learning in a positive way (Bieg et al., 2011; Reeve & Jang, 2006).

Similarly, intrinsic motivation positively affects teachers' willingness to involve in and sustain professional development according to the results of existing studies. Autonomous teachers aim to benefit from in-service trainings and they are more willing to accept innovations and apply them in their classroom (In de Wal et al., 2014; Koestner & Losier, 2002). Another positive outcome that correlates positively with intrinsic motivation toward teaching is mastery goals. Mastery goals push teachers to implement challenges such as challenging instruction in their classrooms because they feel more competent and powerful after achieving a challenging goal (Elliot & Church, 1997; Middleton & Midgely, 1997; Skaalvik, 1997). Another outcome that is in a positive relationship with intrinsic motivation is decrease in severity of reality shock that is experienced in earlier times of the profession. This means that it is easier for intrinsically motivated novice teachers to tolerate mismatches between what is presented during pre-service teaching and what they encounter in real classrooms compared to their extrinsically motivated counterparts (Kim & Cho; 2014). Taken together, it seems that motivation types of teachers determine the quality of teaching they offer and how much they benefit from pre-service training and in-service training they receive. Particularly, the studies conducted with pre-service teachers give evidence on that the more intrinsically motivated teachers are, the more pleasure they get from the activities presented during pre-service training (Özder& Motorcan, 2013; Kaldi & Xafakos, 2017; Koludrović & Ercegovac, 2015; Spittle et al., 2009; Spittle & Spittle, 2014; Taylor et al., 2008; Tekin, 2016; Yüce et al., 2013). As a result, intrinsically motivated pre-service teachers display better academic performance.

Learning style

In a similar vein, learning styles have an effect on academic performance. Existing studies prove that how students learn correlates to how much they learn (Cano, 1999). When learners' learning styles comfort the teaching methodologies of the instructor, they have less difficulty in storing the information in their memories. As these learners are properly taught, they can easily make use of the information presented and they develop a positive attitude toward what has been taught. This means that a difference in learning styles of individuals is likely to influence their academic performance in a positive way (Arbabisarjou et al., 2016). Similarly, it could be claimed that analyzing the learning styles of students is significant in terms of accommodating teaching to students' needs, which in turn, will increase the academic performance (Fuad et al, 2020).

Different theories classify learning styles into different categories. One of the theories on learning styles was put forward by Kolb (1999). Experiential Learning Theory was based on six principles about learning. Firstly, learning is a process-oriented action and learners need to be provided with feedback during the process. Second, learning is a constructive process in which learners' existing knowledge and beliefs should be uncovered in order to reconstruct the new knowledge. Third, conflicts between the

external world and what is taught need to be resolved in order to let learning occur. During this conflict-resolution process, learners should be allowed to reflect. Fourth, learning is holistic and involves not only cognitive processes but also feelings, perceptions and both observable and nonobservable behaviors. Fifth, learning occurs as a consequence of interaction between learners and learning setting. Lastly, learning is a process and in this process learners should be provided with necessary opportunities to create their own meaning and construct knowledge (Kolb & Kolb, 2009; Kolb, 1999).

Based on these six principles, learning styles reveal as a result of interaction among four different learning modes. These learning modes are concrete experience, abstract conceptualization, reflective observation, and active experimentation. Interaction of these four modes determines learning styles of individuals. Assimilating is the first learning style and assimilators need to observe actions and people around them before they act. They are good at reasoning, reviewing facts and assessing experiences as a whole. Although they are good at analyzing vast amounts of knowledge, they don't succeed in applying the same knowledge to new experiences. Second, individuals having the converging learning style use problem solving and deduction to learn. They are good at applying theories and ideas to new experiences and making quick and practical decisions. However, they have difficulty interacting with people because of weak interpersonal skills. Third, individuals having the diverging learning style put a different perspective on events and they need to observe when they encounter different situations. Thus, these individuals adopt a creative and original approach. They value feelings and they are interested in others, so they have strong interpersonal skills. Lastly, individuals having the accommodating learning style would rather benefit from experiences of people around them because they use past experiences to learn. They are curious researchers and sociable people good at interpersonal interaction (Kolb,1999).

The evidence on the relationship between learning styles and academic performance comes from a number of studies. An existing study carried out by İlçin et al. (2018) with physiotherapy students revealed the positive relationship between academic performance and participatory learning style. Another study by Ha (2021) demonstrated that various learning styles along with learning environment influence academic achievement either positively or negatively. Lastly, an existing study conducted in applied science courses gave evidence on the relationship between study habits, academic achievement, and learning styles of science students (Magulod Jr, 2019).

In conclusion, the related body of research suggests that how much pre-service teachers learn during their in-service training is influenced by two variables that are academic motivation types and learning styles and these two factors determine their quality of teaching in the future. Thus, a relationship between academic motivation types and learning styles seems possible. However, to the researcher's knowledge, no study has explored the relationship between pre-service teachers' learning styles defined by Experiential Learning Theory and academic motivation types defined by Self-determination Theory so far. Research that explores the relationship between learning styles and motivation exists in the related body of literature (Kirn, 2009; Maison et al,

2019; Sengodan & Iksan, 2012). However, these studies are scarce in number. Additionally, they were conducted with participants having a different profile, with different motivation theories, or learning style theories. Thus, this present study was conducted in order to investigate the possible relationship between learning styles and academic motivation types of pre-service EFL teachers. With this aim in mind, following questions were formulated:

1. Is there a relationship between year levels and academic motivation types of pre-service EFL teachers?

2. Is there a relationship between year levels and learning styles of pre-service EFL teachers?

3. Is there a relationship between gender and learning styles of pre-service EFL teachers?

4. Is there a relationship between gender and academic motivation types of pre-service EFL teachers?

5. Is there a relationship between academic motivation types and learning styles of pre-service EFL teachers?

2. METHOD

In the study, a descriptive correlational design was utilized. Descriptive correlational studies aim to describe the relationship among variables rather than to infer cause and effect relationships. Descriptive correlational research is useful for describing how one phenomenon is related to another in situations where the researcher has no control over the independent variables (Lappe, 2000). In the present study, independent variables are academic motivation types defined by Self-determination Theory and learning styles defined by Kolb's Experiental Learning Theory and the researcher has no control over them. Two scales were used for revealing the potential relationship. Before collecting the data, required ethical and administrative permissions were obtained (Ethical approval was obtained from Alanya Alaaddin Keykubat Universıty Social and Human Sciences Scientific Research and Publication Ethics Committee with decision number 08/19 and dated 11.11.2021). After that, the scales were delivered to the pre-service teachers during tutorials in early fall semester, Jan-Feb, 2022.

Participants

The theoretical universe of this research is pre-service EFL teachers of a state university, Alanya Alaaddin Keykubat University, in Turkey. As the universe was small in number, a convenience sampling method was used and all pre-service EFL teachers were asked to participate in the study. A total of 248 (of 271: 70% of the universe) pre-service teachers enrolled in the department volunteered to complete the scales. However, because of mistakes they made while coding the scales, responses taken from 198 pre-service EFL teachers were analyzed during the data analysis. Concerning the mistakes, some pre-service teachers did not mark the scales as required, so these scales could not be

analyzed. While all pre-service teachers were identified to have a definite learning style, some of them was seen to be dominant in two or more motivational categories, and these pre-service teachers were coded as two or more responses with different motivational styles. Thus, 257 responses received from 198 pre-service EFL teachers were used during the data analysis. Overall profile of the participants is presented in Table 1.

Table 1.

Overall profile of the participants

Year Level	Gender		
	Male	Female	TOTAL
Freshman	23	22	45
Sophomore	22	24	46
Junior	30	24	54
Senior	25	28	53
TOTAL	100	98	198

As illustrated in Table 1, number of freshmen pre-service teachers is 45, sophomore pre-service teachers 46, junior pre-service teachers 54, and senior pre-service teachers 53. Regarding the gender of the pre-service teachers, 100 male and 98 female pre-service teachers took part in the study.

Data collection tools

Two scales (Academic Motivation Scale and Learning Styles Inventory-III) were used to measure learning styles and academic motivation types of the pre-service teachers in the ELT department respectively. Vallerand et al.'s Academic Motivation Scale (1992) is commonly used in the related body of literature to determine university students' academic motivation types based on Self-determination Theory. Adapted version of this scale measures academic motivation types of Turkish university students (Demir, 2008), so adapted version of the scale was used in this study. Similarly, the scale used for determining learning styles of the participants was developed by Kolb (1999) in line with Experiential Learning Theory and it measures learning styles of the respondents. Gencel (2007) adapted the original scale into Turkish language and it is the latest Turkish version in the related body of literature.

Academic motivation scale was adopted from Demir (2008) who adapted Vallerand et al.'s Academic Motivation Scale (1992) to higher education. The academic motivation scale includes 28 seven-point Likert scale items (1: absolutely false and 7: absolutely

true). It measures amotivation, intrinsic motivation (in three dimensions that are knowing, achieving and stimulating experience), and extrinsic motivation (in three dimensions that are defined regulation, internalized regulation, and externalized regulation). The scale comprises 28 items and 7 factors. The scale is highly reliable since its Cronbach-alpha coefficient value is 0.85. Besides, Cronbach-alpha coefficients of the factors were as follows: knowing: 0.77, achieving: 0.70, stimulating experience: 0.70, defined regulation: 0.73, internalized regulation: 0.73, and externalized regulation: 0.73 (Demir, 2008).

Additionally, Learning Styles Inventory III by Kolb (1999) was used to gather data about learning styles of the pre-service EFL teachers. The scale was translated into Turkish Language in a prior study conducted by Gencel (2007). The correlation coefficient between Turkish and English versions of the scale is 0,77; which means that the Turkish version is equivalent to its English form. The reliability coefficients obtained with the Turkish form ranges between 0,71-0,84. Both versions of the inventory measure learning styles in four categories that are assimilating, accommodating, diverging, and converging. In the inventory, respondents are presented 12 unfinisted statements and 4 options to complete these statements. For each statement, respondents are required to order the options from 1 (suits respondents well) to 4 (does not suit respondents). The sum of the first statements gives respondents' score on CE: Concrete Experience; the second column gives the score on RO: Reflective Observation; the score on the third column is for AC: Abstract Conceptualization; and the fourth column is the score on AE: Active Experimentation. Each score is transferred to the Learning Style Profile and learning styles of the respondents are defined according to the point that ranges between -36 and +36. Total point of a respondent corresponds to one of four learning styles defined by Experiental Learning Theory (Gencel, 2007).

Turkish versions of the scales were preferred because of two reasons. First, in order to avoid confusion resulting from responding to the scales in two different languages, Turkish versions of both scales were delivered. Second, naturally, participants are more proficient in their mother tongue, so Turkish versions of the scales were preferred in order to raise the validity of the results.

Data Analysis

In the data analysis, pre-service teachers' learning styles and academic motivation types were examined. Possible relationships between the categories presented in the research questions were calculated via the pearson's chi-square test of independence that is a non-parametric and statistical significance test performed on categorical data. This test is used in order to test the relationship between two variables that have multi-categories (Curtis & Youngquist, 2013; McHugh, 2013). There are two varriables in this study. First variable, motivation, has seven categories and second variable, learning style, has four categories. Besides, as the data gathered demonstrated non-parametric (McHugh, 2013), or free, distribution, pearson's chi-square test of independence was run in SPSS software (standart packet, 2022 version).

3. FINDINGS

The first question investigated whether there was a relationship between year levels and academic motivation types of pre-service EFL teachers. Results of the statistical analysis demonstrated that there was a significant relationship between year levels and academic motivation types of senior, sophomore, and freshmen pre-service teachers (Table 2).

Table 2.

Year levels and academic motivation types of pre-service teachers-I

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	94.396a	10	<.001
Likelihood Ratio	73.964	10	<.001
Linear-by-Linear Association	4.906	1	.027
N of Valid Cases	257		

a. 10 cells (55.6%) have expected count less than 5. The minimum expected count is .28.

As illustrated in Table 2, p value is <001. As the p value of the test result is lower than .05, the expected relationship was confirmed for senior, freshmen, and sophomore pre-service EFL teachers. However, it was rejected for junior pre-service teachers. While freshmen were more likely to have internalized regulation (extrinsic motivation), the academic motivation type of sophomores was mostly knowing (intrinsic motivation) and seniors' academic motivation type was mostly externalized regulation (extrinsic motivation) (Table 3).

Table 3.

Year levels and motivation types of pre-service teachers-II

Year level * motivation Crosstabulation

		Motivation type					
		knowing	achieving	stimulating experience	internalized regulation	externalized regulation	Total
Year level	Freshmen	23	21	0	130	124	298
	Sophomore	42	0	4	0	32	78
	Senior	0	0	0	0	24	24
Total		65	21	4	130	180	400

Second question of the study investigated whether there was a relationship between year levels and learning styles of pre-service EFL teachers. Test result of the Pearson Chi-Square test was not statistically significant, meaning that year levels of pre-service teachers in the ELT department do not determine their learning styles.

Third question of this study asked if there was a relationship between gender and learning styles of pre-service EFL teachers. Results illustrated that there was a significant relationship between gender and learning styles of pre-service EFL teachers (Table 4).

Table 4.

Test results about gender and learning styles of pre-service teachers

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	178.956a	2	<.001
Likelihood Ratio	207.100	2	<.001
Linear-by-Linear Association	134.474	1	<.001
N of Valid Cases	257		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.55.

As illustrated in Table 4, p value is <001. As the p value of the test result is lower than .05, the expected relationship was confirmed. According to the frequency values, female pre-service EFL teachers were more likely to prefer diverging style (71 out of 71

responses) while male students' dominant learning style was assimilating (88 out of 186 responses). Therefore, it could be claimed that gender is a factor that influences learning styles of pre-service EFL teachers.

The fourth question of the study asked if there was a relationship between gender and academic motivation types of pre-service EFL teachers. Results revealed the relationship between gender and academic motivation types of pre-service EFL teachers (Table 5).

Table 5.

Test results for gender and academic motivation type

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	125.548a	4	<.001
Likelihood Ratio	169.864	4	<.001
Linear-by-Linear Association	8.031	1	.005
N of Valid Cases	257		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.94.

As seen in Table 5, p value is <001. As the p value of the test result is lower than .05, expected relationship was confirmed. According to frequency values, female pre-service teachers' dominant motivational categories were externalized regulation (48 out of 128 responses) and stimulating experience (47 out of 128 responses). Similarly, the dominant motivational category of male pre-service EFL teachers was externalized regulation (53 out of 129 responses). Therefore, it could be claimed that the gender of pre-service teachers determines their academic motivation type.

Additionally, according to the descriptive statistics, pre-service EFL teachers scored lowest in amotivation (seven out of 257 responses). This result means that the number of pre-service teachers having amotivation toward teaching is quite low (Table 6).

Table 6.

Number of pre-service teachers with amotivation towards teaching profession

		Academic motivation type							
		Knowing	achieving	stimulating experience	defined regulation	internalized regulation	externalized regulation	amotivation	Total
Gender	M	31	10	12	16	7	28	**4**	108
	F	44	14	22	23	9	34	**3**	149
Total		75	24	34	39	16	62	**7**	257

The last question formulated for the study asked if there was a relationship between academic motivation types and learning styles of pre-service EFL teachers. Results evidenced that the learning styles and academic motivation types of pre-service EFL teachers were significantly related for converging, assimilating, and diverging learning styles (Table 7).

Table 7.

Test results about learning styles and motivation

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	153.691a	10	<.001
Likelihood Ratio	180.500	10	<.001
Linear-by-Linear Association	7.925	1	.005
N of Valid Cases	257		

a. 3 cells (16.7%) have expected count less than 5. The minimum expected count is 2.53.

As seen in Table 7, p value is <.001. As the p value of the test result is lower than .05, the expected relationship was confirmed. According to the frequency values, the dominant motivational category among diverger pre-service EFL teachers was externalized regulation (39 out of 96 responses). Besides, most of the pre-service teachers with assimilating style had knowing motivation (37 out of 59 responses), as well and the ones with converging style were likely to have externalized regulation (23 out of 45 responses).

4. DISCUSSIONS AND CONCLUSION

This study was conducted in order to find out possible relationship between learning styles and academic motivation types of pre-service EFL teachers. In order to test the relationships in the research questions, the data were gathered from 198 Turkish pre-service EFL teachers enrolled in the ELT department of a state university via Academic Motivation Scale (Demir, 2008) and Learning Styles Inventory III (Gencel, 2007). Chi square test of independence was run in order to examine the expected relationships. Significant findings of the study were as follows:

1. Relationship between year levels and academic motivation types was significant for freshmen, sophomore, and senior pre-service EFL teachers. Dominant academic motivation type of freshmen and seniors was extrinsic motivation and dominant academic motivation type of sophomores was intrinsic motivation.

2. Year levels of pre-service EFL teachers did not differ their learning styles.

3. Gender of pre-service EFL teachers determined their learning style. While most of the female pre-service EFL teachers had diverging style, male pre-service teachers' dominant learning style was assimilating.

4. Gender of pre-service EFL teachers determined their motivation. While female pre-service teachers were more likely to have externalized regulation and stimulating experience, male pre-service teachers were more likely to have externalized regulation.

5. Academic motivation types of pre-service EFL teachers differed across their learning styles. Pre-service teachers with diverging style were more likely to adopt externalized regulation and the ones with assimilating style were more likely to adopt knowing motivation, and the ones with converging style to have externalized regulation.

Findings of the study evidenced that while freshmen were more likely to have internalized regulation (extrinsic motivation), dominant academic motivation type of sophomores was knowing (intrinsic motivation) and seniors' dominant academic motivation type was mostly externalized regulation (extrinsic motivation). These results revealed that pre-service EFL teachers prefer teaching profession because of external reasons such as job security, regular payment, and opportunity to work in the Ministry of Education. However, as they progress through the levels, they may get the pleasure of being knowledgeable in ELT, so they become intrinsically motivated rather than extrinsically motivated in the sophomore year. Ryan and Deci (2000) state that rewards, feedback, or events that facilitate feeling of competence and satisfaction toward an action turn extrinsic motivation into intrinsic motivation. In our case, after spending an academic year in the ELT department, pre-service teachers may be feeling more competent in the field, which in turn promotes the feeling of satisfaction and intrinsic motivation eventually. However, in their senior year, pre-service teachers may become extrinsically motivated probably because of some reasons such as preparing for central exams and finding a proper job after graduation (Kaya & Çenesiz, 2020).

These results gave evidence on that pre-service teachers spent longer time feeling extrinsically motivated than feeling intrinsically motivated during their pre-service training. This result was confirmed by a number of existing studies that demonstrated pre-service teachers displayed moderate to high scores for extrinsic motivation for teaching (e.g., Kaya & Çenesiz, 2020; Koludrović & Ercegovac, 2015; Spittle et al., 2009; Yüce et al., 2013). Last, the results revealed that pre-service teachers scored quite low in amotivation, which was parallel to the results of two existing studies (Koludrović & Ercegovac, 2015; Spittle et al., 2009).

Regarding the relationship between learning styles and gender of the pre-service teachers, while male pre-service EFL teachers were more likely to prefer assimilating style, their female counterparts were more likely to have diverging style. Considering Experiential Learning Theory (Kolb, 1999) diverging learning style is the result of interaction between two modes of learning that are reflective observation and concrete experience. These results imply that female pre-service teachers attach greater importance to interpersonal relationships and feelings and they have strong interpersonal skills. Also, they are good at creating and coming up with genuine approaches (Boyatzis & Mainemelis, 2001; Kolb & Kolb, 2009; Kolb). Taken together, it could be claimed that female pre-service EFL teachers are more likely to outperform their male counterparts in the tasks that require originality and interpersonal interaction. Whereas, male pre-service EFL teachers are more likely to perform better in the tasks that require analyzing vast amounts of knowledge, reasoning, and reviewing because assimilating learning style is the result of two modes of learning that are reflective observation and abstract conceptualization. Also, the results evidenced that female pre-service teachers needed experience-based, people-oriented approaches as well as concrete role play simulations for learning (Heffler, 2001) while male ones needed judgment, deduction, reasoning and discussions for learning.

The results demonstrated that male pre-service EFL teachers preferred abstract conceptualization more than female ones. This result was parallel to the results of a meta-analysis study in which research on gender and learning styles of students, 18 or older was reviewed. The results of the study indicated it was more likely for male students to adopt the abstract conceptualization learning mode (Severiens & Ten Dam, 1994). Similarly, this result was consistent with the results of another existing research on gender and learning styles (Heffler, 2001).

Regarding the academic motivation types and gender, results of the present study indicated a relationship between these two variables for pre-service EFL teachers. While male pre-service EFL teachers were more likely to have externalized regulation (a category of extrinsic motivation), female ones were more likely to have either stimulating experience (a category of intrinsic motivation) or externalized regulation. These results demonstrated that although female pre-service EFL teachers were more intrinsically motivated compared to their male counterparts, both groups were extrinsically motivated toward the teaching profession. Whereas, prior studies proved

that intrinsic motivation was in a relationship with a number of positive outcomes and intrinsically motivated teachers were more likely to produce adaptive outcomes in teaching (Koludrović & Ercegovac, 2015; Vasconcellos et al., 2020). Thus, the findings of the present study evidenced the need for increasing pre-service teachers' autonomous motivation toward teaching profession because motivation of teachers influences how much they benefit from pre-service training they receive. In particular, the studies conducted with pre-service teachers demonstrated that the more intrinsically motivated teachers were, the more pleasure they got from the activities presented during the pre-service training (e.g., Kaldi & Xafakos, 2017; Koludrović & Ercegovac, 2015; Özder & Motorcan, 2013; Spittle et al., 2009; Spittle & Spittle, 2014; Taylor et al., 2008; Tekin, 2016; Yüce et al., 2013). Previous studies demonstrated that autonomous motivation of teachers could be increased via autonomy-supportive pre-service, or in-service training (e.g., Power & Goodnough, 2019; Reeve, 2006).

Last but not least, the results of the statistical analysis confirmed the relationship between academic motivation types and learning styles of pre-service EFL teachers. It was likely that pre-service teachers with diverging learning style adopted externalized regulation (a category of extrinsic motivation), assimilating style prefered knowing motivation (a category of intrinsic motivation), and converging style adopted externalized regulation. The relationship between academic motivation types and learning styles could be explained via nature of education presented during pre-service training and learning modes presented by Experiential Learning Theory (Kolb, 1999). Considering the nature of education, pre-service training presented in education faculties include theoretical content rather than practical work. Additonally, in many education faculties, pre-service EFL teacherss did not have an opportunity to practice English language with foreign people or teacher trainers. Another problem is that students are not provided with an opportunity to select courses, trainers or examination system because of compulsory courses, or lack of teacher trainers (Öztürk, & Aydın, 2019).

Regarding the learning modes presented by Experiential Learning Theory (Kolb, 1999), assimilating learning style is the result of two modes of learning that are reflective observation and abstract conceptualization. This means that assimilators are good at theoretical work while they have difficulty in coming up with new ideas or applying new ideas to different situations. Thus, it is likely that pre-service teachers with assimilating learning style felt more competent, autonomous, and related during their pre-service training, which explains why those students were more likely to have intrinsic motivation toward teaching. However, it seemed probable that pre-service teachers with diverging learning style felt less competent, autonomous, and related during their pre-service training because they prefered concrete experience mode that is provided in a limited way during their pre-service training. Thus, these students developed extrinsic rather than intrinsic motivation toward teaching. Similarly, one of the learning modes that has an influence on converging learning style is abstract conceptualization and

individuals with converging learning style are good at deduction and reasoning, or theoretical work. As the nature of the training provided in education faculties is consistent with the learning style of convergers, these students are more likely to feel competent, autonomous, and related during their pre-service training, so they are more likely to adopt intrinsic motivation.

Considering the results for pre-service EFL teachers it could be put forward that while abstract conceptualization was in a positive relationship with intrinsic motivation, concrete experience was in a positive relationship with extrinsic motivation because nature of pre-service training offered in education faculties is theory-oriented, and abstract conceptualization is more consistent with theoretical content offered. Thus, pre-service teachers preferring abstract conceptualization felt more competent, related and autonomous compared to the ones preferring concrete experimentation.

Regarding the pedagogical implications, this study implies the necessity to increase autonomous motivation of pre-service teachers. Considering the principles of Self-determination Theory, pre-service teachers' autonomous motivation is likely to increase in case three needs for competence, autonomy, and relatedness are fulfilled during pre-service training (Deci & Ryan, 2000; Ryan & Deci, 2000). First, pre-service teachers' need for competence could be fulfilled by increasing the amount of practical work such as research, observations, and preparing unit plans. Replacing theoretical content with the practical one might help pre-service teachers feel more competent. Taylor et al. (2008) claim that competence is in a direct relationship with intrinsic motivation, so an increase in competence will influence intrinsic motivation of pre-service teachers in a positive way. Change in the amount of practical and theoretical work will be beneficial for pre-service teachers that need concrete experience for learning. Learning experiences that match learning styles of pre-service teachers will help them become more intrinsically motivated towards teaching profession.

Second, an increase in autonomy results in an increase in intrinsic motivation. One of the best ways to increase autonomy of students is to give them freedom and decrease pressure (Pelletier et al., 2002). Therefore, pre-service teachers need to be presented with more options regarding selective lessons, types of examinations, schedules and so on during their pre-service training. Last, in order to meet the need for relevance, pre-service teachers should be provided with support of teacher trainers and faculty members. Additionally, a caring and respectful learning environment rich in instructional materials is another way to fulfill the need for relevance (Kaldi & Xafakos, 2017).

To the researcher's knowledge, no study has explored the relationship between EFL pre-service teachers' learning styles defined by Experiential Learning Theory and academic motivation type defined by Self-determination Theory so far. Thus, it is necessary to confirm the result of this study via further studies carried out with different participants in different settings. Especially, the research exploring the academic motivation types of

pre-service and in-service teachers from various fields will contribute to the related body of literature.

References

Arbabisarjou, A., Zare, S., Shahrakipour, M., & Ghoreishinia, G. (2016). The survey of the relationship between the learning style and academic performance in students of medical sciences. *Health Sciences, 5*(7S), 338-342.

Bieg, S., Backes, S., & Mittag, W. (2011). The role of intrinsic motivation for teaching, teachers' care and autonomy support in students' self-determined motivation. *Journal for Educational Research Online*, *3*(1), 122-140.

Bruinsma, M., & Jansen, E. P. (2010). Is the motivation to become a teacher related to pre-service teachers' intentions to remain in the profession?. *European Journal of Teacher Education, 33*(2), 185-200.

Cano, J. (1999). The relationship between learning style, academic major, and academic performance of college students*. Journal of Agricultural Education, 40*, 30-37.

Curtis, K., & Youngquist, S. T. (2013). Part 21: categoric analysis: Pearson chi-square test. *Air Medical Journal*, *32*(4), 179-180.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.

Demir, Z. (2008). *Uzaktan eğitim öğrencilerinin akademik güdülenme düzeyleri (SAÜ örneği*). Unpublished master's thesis dissertation, Sakarya Üniversitesi Sosyal Bilimler Enstitüsü.

Elliot, A. J., & Church, M. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218–232.

Fuad, A. Z., & Andriana, M. (2020, May). Why does individual learner perform better than others? Relating students learning style to academic performance. In *International Conference on English Language Teaching (ICONELT 2019)* (pp. 319-322). Atlantis Press.

Gencel, İ. E. (2007). Kolb'un deneyimsel öğrenme kuramına dayalı öğrenme stilleri envanteri-III'ü Türkçeye uyarlama çalışması [Study of adapting learning styles inventory-III based on Kolb's experiential learning theory into Turkish]. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi 9*(2), 120-139.

Ha, N. T. T. (2021). Effects of learning style on students achievement: experimental research. *Linguistics and Culture Review*, *5*(S3), 329-339.

Heffler, B. (2001). Individual learning style and the learning style inventory. *Educational studies*, *27*(3), 307-316.

İlçin, N., Tomruk, M., Yeşilyaprak, S. S., Karadibak, D., & Savcı, S. (2018). The relationship between learning styles and academic performance in Turkish physiotherapy students. *BMC Medical Education*, *18*(1), 1-8.

In de Wal, J. J., den Brok, P. J., Hooijer, J. G., Martens, R. L., & van den Beemt, A. (2014). Teachers' engagement in professional learning: Exploring motivational profiles. *Learning and Individual Differences*, *36*, 27-36.

Kaldi, S., & Xafakos, E. (2017). Student teachers' school teaching practice: The relation amongst perceived self-competence, motivation and sources of support. *Teaching and Teacher Education, 67*, 246-258.

Kaya, Z., & Çenesiz, G. Z. (2020). The predictor roles of life-satisfaction, and intrinsic-extrinsic motivation on the psychological well-being of pre-service teachers. *International Online Journal of Education and Teaching (IOJET), 7*(4). 1370-1387. http://iojet.org/index.php/IOJET/article/view/948

Kim, H., & Cho, Y. (2014). Pre-service teachers' motivation, sense of teaching efficacy, and expectation of reality shock. *Asia-Pacific Journal of Teacher Education, 42*(1), 67-81.

Kirn, T. Y. (2009). Korean elementary school students' perceptual learning style, ideal L2 selt and motivated behavior. *English Language and Linguistics*, *9*(3), 459-486.

Koestner, R., & Losier, G. F. (2002). Distinguishing three ways of being highly motivated: A closer look at introjection, identification, and intrinsic motivation. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of Self-determination Research* (pp. 101–121). University of Rochester Press.

Kolb, A. Y., & Kolb, D. A. (2009). Experiential Learning Theory: A dynamic, holistic approach to management learning, education and development. In S. J. Armstrong & C. V. Fukami (Eds.), *The Sage Handbook of Management Learning, Education and Development* (pp. 42-68). Sage Publishing.

Kolb, D. A. (1999). *The Kolb Learning Style Inventory*. Hay Resources Direct

Koludrović, M., & Ercegovac, I. R. (2015). Academic motivation in the context of self-determination theory in initial teacher education. *Croatian Journal of Education, 17*(1), 25-36.

Lappe, J. M. (2000). Taking the mystery out of research: Descriptive correlational design. *Orthopaedic Nursing*, *19*(2), 81.

Magulod Jr, G. C. (2019). Learning styles, study habits and academic performance of Filipino University students in applied science courses: Implications for instruction. *JOTSE: Journal of Technology and Science Education*, *9*(2), 184-198.

Maison, A., Darmaji, D. A. K., & Rahmat Perdana, L. A. (2019). The phenomenon of physicology senior high school education: Relationship of students' attitudes toward physic, learning style, motivation. *Universal Journal of Educational Research*, *7*(10), 2199-2207.

McHugh, M. L. (2013). The chi-square test of independence. *Biochemia Medica, 23*(2), 143-149.

Middleton, M. J., & Midgely, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology*, *89,* 710–718.

Özder, H., & Motorcan, A. (2013). An analysis of teacher candidates' academic motivation levels with respect to several variables. *British Journal of Arts and Social Sciences, 15*(1), 42-53.

Öztürk, G, Aydın, B. (2019). English language teacher education in Turkey: Why do we fail and what policy reforms are needed?. *Anadolu Journal of Educational Sciences International (AJESI), 9*(1), 181-213.

Pelletier, L. G., Séguin-Lévesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching behaviors. *Journal of Educational Psychology, 94*(1), 186.

Power, K., & Goodnough, K. (2019). Fostering teachers' autonomous motivation during professional learning: a self-determination theory perspective. *Teaching Education, 30*(3), 278-298.

Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal*, *106*(3), 225-236.

Reeve, J., & Jang, H. (2006). What teachers say and do to support students' autonomy during a learning activity. *Journal of Educational Psychology, 98*(1), 209.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54-67.

Sengodan, V., & Iksan, Z. H. (2012). Students' learning styles and intrinsic motivation in learning mathematics. *Asian Social Science*, *8*(16), 17.

Severiens, S. E., & Ten Dam, G. (1994). Gender differences in learning styles: A narrative review and quantitative meta-analysis. *Higher Education*, *27*(4), 487-501.

Skaalvik, E. M. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology, 89*, 71–81.

Spittle, M., Jackson, K., & Casey, M. (2009). Applying self-determination theory to understand the motivation for becoming a physical education teacher. *Teaching and Teacher Education, 25*(1), 190-197.

Spittle, S., & Spittle, M. (2014). The reasons and motivation for pre-service teachers choosing to specialise in primary physical education teacher education. *Australian Journal of Teacher Education, 39*(5), 1-25.

Taylor, I. M., Ntoumanis, N., & Standage, M. (2008). A self-determination theory approach to understanding the antecedents of teachers' motivational strategies in physical education. *Journal of Sport and Exercise Psychology, 30*(1), 75-94.

Tekin, A. K. (2016). Autonomous motivation of Omani early childhood pre-service teachers for teaching. *Early Child Development and Care, 186*(7), 1096-1109.

Vallerand, R. J., Pelletier, L., Blais, M., Briere, N., Senecal, C., & Vallieres, E. (1992). The academic motivation scale: a measure of intrinsic motivation, extrinsic motivation, and amotivation in education. *Education and Psychological Measurement, 52*, 1003–1017.

Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N. & Lonsdale, C. (2020). Self-determination theory applied to physical education: A systematic review and meta-analysis. *Journal of Educational Psychology*, *112*(7), 1444.

Wang, C. K. J., & Liu, W. C. (2008). Teachers' motivation to teach national education in Singapore: a self-determination theory approach. *Asia Pacific Journal of Education, 28*(4), 395-410.

Yüce, K., Şahin, E. Y., Koçer, Ö., & Kana, F. (2013). Motivations for choosing teaching as a career: A perspective of pre-service teachers from a Turkish context. *Asia Pacific Education Review, 14*(3), 295-306.

Ethical approval was obtained from Alanya Alaaddin Keykubat Universıty Social and Human Sciences Scientific Research and Publication Ethics Committee with decision number 08/19 and dated 11.11.2021.

Conflict of Interest Statement

There is no conflict of interest

Statement of Financial Support or Acknowledgment:

No financial support was received from any institution for this study. No Acknowledgment.