



## Teachers' Characteristics Influencing Their Individual And Collective Learning Preferences

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### Abstract

This study aimed at finding out the level of teachers' individual and collective learning and analysing the influence of their personal, organizational and professional characteristics on these learning types. We collected data representing teachers' learning behaviours and their personal (*gender, total experience, current school experience, school level, school size and school SES*) and organizational-professional characteristics (*self-efficacy, aspiration, recognition, positive climate, student oriented practices, task oriented practices and symbols-values*). A total of 340 teachers working in primary, lower secondary and secondary schools located in Aksaray province of Turkey, comprised the sample. We analysed data using descriptive statistics, exploratory factor analysis, two-step clustering analysis and binary logistic regression.

We found that teachers were overwhelmingly individual learners and *aspiration* is the most powerful professional characteristic affecting teachers' learning preferences. Beside *aspiration, self-efficacy* and *student oriented practices* were also able to effect on teachers' individual learning. *School climate*, differently from other significant predictors, was able to detect the high-level collective learners. The only individual characteristics, *school level* was a significant predictor. Teachers, who work at the primary level, are tend to be collective learner. Based on the results, we suggested to widen the area of teachers' individual initiatives and to compose groups working collectively towards challenging goals for enhancing students' learning.

### Keywords

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### Introduction

There is a widespread agreement on the importance of teachers learning in terms of school development (Fernandez, 2005; Teaching and Learning International Survey, 2014; Sherin, 2004). While system wide incentives and implications drive teachers into systematic professional development activities, however, these activities are mostly inadequate in meeting teachers' genuine needs and expectations (Cameron, Mulholland, & Branson, 2013; Hallinger & Liu, 2016; Kyndt, Gijbels, Grosemans, & Donche, 2016).

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Studies indicate the importance of sustained, intensive, relevance activities for teachers learning in school settings (Hoekstra & Korthagen, 2011; TALIS, 2014; Slavits & McDuffie, 2009). Therefore; activities should meet their individual professional requirements (Reiff & Cannella, 1990). Effective teacher learning should coherence with teachers own professional goals (Bolhuis, Schildkamp, & Voogt, 2016; Kooy & van Veen, 2011). Groundwater-Smith and Mockler (2009) argue about the effectiveness of state-design professional development activities. Professional learning activities designed by out of school bodies and oblige teachers to participate in are not so effective in teachers' learning. This issue is also applicable for Turkey. It is stated that professional development activities organized by ministerial bodies do not satisfy the genuine learning needs of teachers (Bümen, Ateş, Çakar, Ural, & Acar, 2012; Ünver, 2014; Yıldırım, 2016). Instead of it, they put emphasise on informal workplace learning of teachers. They regarded teachers' experiences, expertise and insights. In school settings, teachers interact with colleagues, students, principals and other staff and they informally learn during these daily activities. This kind of learning also called as informal learning, which occurs "either individually or collectively but without an instructor" (Hallinger & Liu, 2016; Kock & Ellström, 2011; Kyndt et al. 2016).

School improvement focus on teachers' learning through school capabilities. As noted by Liu, Hallinger, and Feng (2016) "schools contain a wealth of professional knowledge". Based on the socio-cultural theories of learning, schools function as teachers' learning environments, in which teachers individually or collectively can learn. Teachers' learning simultaneously happens in school environment is more efficient (Hallinger & Liu, 2016). If teachers learn by their own initiatives, it is called "self-directed learning" or "individual learning" (Mushayikwa & Lubben, 2009; Slavits & McDuffie, 2009). This learning mostly happens unconsciously (Korthagen, 2017). Every classroom has some unique differences that demands teachers to learn specific things. As Schein (2010) noted that "different classes can behave completely differently from each other even though material and teaching style remains the same". Based on the individual professional needs, teachers develop their own professional learning ways. They look for opportunities enabling them more effective in teaching profession (Cameron et al., 2013). Accordingly, the notion of *researcher teacher*, also drive teachers to learn individually. These reasons seem to lead teachers to learn individually. Slavits and McDuffie (2009) found the crucial roles of teachers' attitude, attention and awareness in the self-directed teacher learning. On the other hand, institutional activities require teachers to work in-group. During these activities they can evaluate daily teaching activities, discuss problems etc. so they interact each other. Organizational professional features also provide them learning environment. Teachers learn when they make conversations with colleagues or work with a partner on particular task or share materials and resources (Kyndt et al., 2016). According to Bolhuis et al. (2016) unless conversations among teachers focus on their own teaching experiences rather than general, it would not be more effective learning. In addition, Flaschberger, Gugglberger, and Dietscher (2013) argued that individual learning is not transferred into organizational learning because of lack of professional collaboration. Without collaborative culture, individual learning does not serve for collaborative learning and in turn organizational learning. On the other hand, existence of group learning environment itself can also drive teachers to learn individually because group works can stimulate teachers to start the more depth inquiry so, they read professional literature, experiment new techniques, asking questions to experts etc. (Slavits & McDuffie, 2009).

Teachers' experiences, attitudes, behaviours and a set of factors shape their tendency of learning (Reiff & Cannella, 1990). Depending on the learning infrastructure in school (school culture), some teachers prefer individual learning rather than collective learning. Therefore, among teachers in a particular school, one learning way might be more prominent. There must be some antecedents forming a typical learning preference of teachers. What are the factors leading teachers to learn either individually or cooperatively? For instance, Liu et al. (2016) indicated the significant effect of teachers' self-efficacy and autonomy on their professional learning. Positive school environment encourages teachers to learn individually and cooperatively. In some cases, teachers do learn even though lack of specific support of school leaders (Hoekstra & Korthagen, 2011; Kyndt et al., 2016). Experience can affect

teachers' learning behaviours (Flores, 2005; Mawhinney, 2010; Patrick, Elliot, Hulme, & McPhee, 2010). Factors, that may affect learning preferences of teachers at school, can more broadly be classified as demographic, organizational and professional characteristics. Demographic characteristics contain both personal (gender, age, etc.) and organizational (school size, location etc.) features. Professional characteristics can include individual professional characteristics such as *aspiration, self-efficacy, recognition* etc. and organizational professional characteristics such as *school climate, student oriented practices at school, task oriented practices at school* etc. (Kyndt & Baert, 2013; Liu et al., 2016; Slavit & McDuffie, 2009).

Although cooperative learning seem to be much more precious for school improvement (Darling-Hammond & Richardson, 2009; Lunenburg & Ornstein, 2012) but complex interaction between individual learning and cooperative learning may mitigate the conscious behaviours of school principals and other responsible bodies. Nonetheless, these two types of informal learning are neither independent nor completely dichotomy (Kyndt et al., 2016). Despite the existence of studies on the concepts of "organizational learning", "learning school", "learning community" in Turkey (Kalkan, 2015; Karabağ Köse, 2013; Öğdem, 2015; Yavaş, 2012) however, no study focused on teachers' learning ways at schools was found. There is a need for studies examining how teacher learning happens in school settings (Cameron et al., 2013; Fraser, 2010). According to Kyndt et al. (2016) research on teachers' informal learning in school settings is rather scarce, there is a need for quantitative studies with large samples involving different cultural contexts.

#### *Aim of the study*

This study can contribute into the field of research and practice as developing our understanding on the nature of school based learning in different cultural context. By this study, particularly finding out the influence of the possible factors leading teachers to learn individually or cooperatively was aimed. We operationally tested the effects of school culture measures and teachers' professional well-being measures on teachers' learning behaviours in school environment. The study focused on the following research questions:

1. How are teachers' individual and cooperative learning preferences and what are their levels?
2. How is the influence of their personal and organizational characteristics on learning preferences?
3. How is the influence of teachers' professional characteristics on their learning preferences?.

### **Method**

#### *Design*

We carried out this study in correlational design. Correlational research aims at clarifying "our understanding of important phenomena by identifying relationships among variables" (Fraenkel, Wallen, & Hyun, 2012). Along with the correlational design, we implemented logistic regression analysis, which can establish an acceptable model defining the relationship between the predictor (independent) variables and the predicted (dependent) variables (Tabachnick & Fidell, 2013).

#### *Context*

As in many other countries, Turkey has experienced a series of educational reform in past decade. Changes in many aspects of education system such as curriculum, school governance and teaching approach (e.g. introducing the constructivist approach) required teachers to adapt to new education infrastructure. Ministry of National Education (MoNE) organized numerous training activities across the country to introduce changes. However, expectation of development was not satisfied. The gap between theory and practice, the inadequate number of expert people in centrally organized training activities, exclusion of teachers in decision making processes of the educational changes are some of the basic reasons of that result (Bümen et al., 2012; Ünver, 2014; Yıldırım, 2016). MoNE, tried e-learning activities without gathering teachers in certain training centres. Teachers

obliged watching videos in school settings at particular session. Nonetheless, policy makers have already noticed the useless of these efforts and been looking for alternative but more effective ways of teachers' learning. School based informal learning, despite the existence of theoretical awareness at the school; it has not been systematically put into practice, yet.

### **Population and Sample**

We chose Aksaray province as a case for this study since it is easily accessible for researcher and representative of typical Anatolian cities. Aksaray province, which is located in Cappadocia Region of Central Turkey, has population slightly over 200 thousand. We used data belonged to teachers who are selected by stratified random sampling as representing totally 2 721 teachers work at the schools serving at primary, lower secondary and secondary level in city centre of Aksaray province (Directorate of National Education in Aksaray, 2016). In sampling procedure, we considered each education level as a layer then we listed all schools separately. We randomly selected schools from the school lists and we delivered data collector to all volunteer teachers from those who working in selected schools (378 teachers from 34 schools). We analysed the data belonged to 340 teachers from different branches working at public schools.

Table 1 shows the demographic characteristics of teachers and their schools. Nearly 46 % of teachers were female and 18.5 % of the teachers were in their first five years of service. In general, they were highly experienced teachers that 40% of them have 16 years and more of service. Nearly 2/3 of them were working at big schools, which has more than 30 teachers. 57% of the teachers were working at the lower secondary level and most of the participants (61.2 %) had students from medium level socio-economic status (SES).

**Table 1.** Demographic Information About Participants

<b>Characteristics</b>	<b>f/%</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Total</b>
Gender	f	155	185	-	-	340
1:Female; 2:Male	%	45.6	54.4	-	-	100
Total experience (year)	f	63	76	68	133	340
1:5 year and less 2:6-10; 3:11-15; 4:16 and more	%	18.5	22.4	20.0	39.1	100
Level	f	122	194	24	-	340
1:Primary; 2:Lower secondary; 3:Secondary	%	35.9	57.1	7.1	-	100
Experience at current school	f	59	85	117	79	340
1:First year; 2:1-2 year; 3:3-5 year; 4:6 and more	%	17.4	25.0	34.4	23.2	100
School size (Number of teachers)	f	38	90	212	-	340
1:Small; 2:Medium; 3:Big	%	11.2	26.5	62.4	-	100
School SES (Perceptions of teachers)	f	99	208	33	-	340
1:Low; 2:Medium; 3:High	%	29.1	61.2	9.7	-	100

### **Measures and Instrumentation**

A questionnaire, consisted four data collection tools (*demographic, learning preference, individual professional features and organizational professional features*) was used to gather the data in this study. Table 2 shows the descriptive statistics (M, SD), factor loadings, results of item analysis and internal consistency coefficient (Cronbach's Alpha) belonged to all sub-scales used in the study. We used a five-point Likert-type scale whereby a higher score indicates a stronger presence of the constructs for all sub-scales. Based on the results of item analysis, we did not need item redundancy. Scores of item-total correlations change between .37-.79. We considered the scores smaller than .30 as criteria for deletion. "Cronbach's Alpha if item deleted" indicate only one item (A6) which can be excluded from the scale but we considered its theoretical contribution and kept it (Pituch & Stevens, 2016; Seçer, 2015).

i) *Demographic part* had six questions demanding personal information (*gender, total experience and experience at current school*) and organizational information (*school level, school size, socio-economic condition of school environment*). School size indicates the number of tenure teachers in a particular school (15 or less number of teachers represent small schools, between 16-30 teachers explain medium size school and more than 30 teachers indicate big school). Socio-economic status of school environment is defined based on the teachers' perceptions that we demanded teachers to estimate what percent of students comes from which level of SES background in a particular classroom.

ii) *Teachers' learning preference*: Literature review indicated the most prominent school based teachers' learning activities such as making conversations related with students, teaching and other professional matter; collaborating with colleagues, sharing materials and resources; researching professional matters and reading professional literature; experimenting new techniques, observation and reflection (Bolhuis et al., 2016; Cameron et al., 2013; Groundwater-Smith & Mockler, 2009; Hallinger & Liu, 2016; Kyndt et al., 2016; Slavit & McDuffie, 2009).

**Table 2.** Constructs and item analysis of sub scales (N=340)

Factor	Item	Content	Loadings	Mean	SD	Item-Total Correlation	$\alpha$ if Item Deleted
Individual Learning $\alpha=.815$	A1	I follow recent developments about my profession	.78	4.37	.75	.59	.77
	A2	I make conversations with my colleagues on professional issues	.68	4.46	.80	.55	.77
	A8	I transfer theoretical knowledge related with teaching into practice.	.65	4.39	.71	.56	.77
	A5	I look for new methods to perform my profession more effectively.	.64	4.51	.61	.56	.78
	A4	I regularly read professional literature (book. journal. studies etc.).	.64	3.79	.95	.51	.78
	A7	I share the effective things (material. method...) in teaching with my colleagues.	.63	4.44	.68	.56	.77
	A3	I have productive talks with the school administrators on professional issues.	.58	3.93	1.02	.50	.79
	Sub-scale averages			4.27	.79	.55	.78
Collective learning $\alpha=.765$	A10	Everybody in this school strive for specialization on their profession.	.85	4.01	.87	.70	.63
	A11	People in this school apply the new methods and techniques in their classroom.	.82	4.03	.83	.60	.69
	A9	Teachers share knowledge, experience and material with their colleagues.	.77	4.15	.81	.60	.68
	A6	Teachers demand help from colleagues in terms of professional matters.	.44	4.11	.90	.37	.81
	Sub-scale averages			4.08	.85	.57	.70
Self-efficacy $\alpha=.809$	B17	I have knowledge and skills to carry out my profession adequately.	.73	4.53	.66	.63	.76
	B4	I know the rules demanded by teaching profession	.71	4.60	.66	.53	.78
	B10	I have technical knowledge and skills. which are necessary for my profession	.70	4.51	.68	.59	.77

**Table 2.** Continued

Self-efficacy $\alpha=.809$	B18	I decide innovative applications in my classroom.	.66	4.31	.74	.61	.77
	B3	I make own decisions related with my profession in my classroom.	.64	4.42	.80	.51	.79
	B13	I consider others' directions about professional issues but I make last decision.	.55	4.44	.76	.53	.78
	Sub-scale averages			4.47	.72	.57	.78
Aspiration $\alpha=.758$	B27	I have plans on professional issues that make me excited.	.66	3.96	.99	.51	.71
	B11	I always have an enthusiasm for doing professionally new things.	.66	4.38	.73	.57	.69
	B19	I can perform my profession successfully in somewhere else.	.54	4.49	.70	.55	.70
	B12	I can carry out my profession effectively even in most difficult condition.	.52	4.22	.77	.53	.70
	B14	I effectively and productively utilize technological devices in my profession.	.51	4.27	.81	.45	.73
Sub-scale averages			4.26	.80	.52	.71	
Recognition $\alpha=.737$	B8	Teaching profession is highly respected in this environment.	.71	3.44	1.16	.51	.70
	B5	I receive appreciations because of my professional success.	.70	3.82	1.09	.60	.64
	B23	School management appreciate me because of my professional success.	.64	3.75	1.07	.63	.62
	B9	My colleagues and I make decision related with our profession in work environment.	.50	4.14	.84	.41	.74
Sub-scale averages			3.79	1.04	.54	.67	
School Climate $\alpha=.901$	C1	This school has a trust and collegial but not hostile environment.	.81	4.22	.90	.76	.88
	C5	People in this school mostly experience joyful, compassion and courtesy.	.74	4.06	.91	.79	.87
	C2	People in this school behave honestly with each other.	.73	3.92	.90	.72	.88
	C6	Teachers' achievement, professional growth and their happiness are emphasized.	.65	3.99	.92	.71	.88
	C3	People in this school open to spontaneous communication.	.64	4.27	.79	.61	.89
	C9	People in this school produce original things using their creativeness.	.64	3.73	.95	.67	.88
	C8	People in this school displays friendly behaviours such as touching and hugging.	.63	3.43	1.15	.56	.90
	C7	People in this school protect and support each other.	.63	3.84	.98	.66	.88
Sub-scale averages			3.93	.94	.69	.88	
Student Oriented $\alpha=.836$	C21	Teachers in this school behave considering students' well-being.	.78	4.54	.65	.70	.78
	C22	Teachers positively response to students' help demands.	.76	4.51	.71	.66	.79
	C20	Teachers deal with the students' problems and try to solve them.	.72	4.31	.79	.64	.79
	C23	People in this school give importance and care for ceremonies.	.62	4.26	.82	.60	.81
	C24	People in this school strictly adhere to the rules.	.56	4.01	.84	.58	.81
Sub-scale averages			4.33	.76	.63	.80	

**Table 2.** Continued

Task oriented $\alpha=.872$	C26	People in this school fulfil their responsibilities.	.78	4.19	.88	.78	.81
	C27	Teachers easily express their will and demands to managerial bodies.	.70	4.16	.94	.68	.85
	C25	Teachers put emphasis on carrying out the responsibilities as they are scheduled.	.70	4.28	.77	.73	.83
	C29	People in this school spend effort for the success of the school.	.59	4.32	.80	.72	.84
	Sub-scale averages			4.24	.85	.73	.83
Symbols and values $\alpha=.883$	C16	People widely use symbols, emblem etc. that represent the institution.	.82	3.29	1.25	.73	.85
	C17	School community has common symbols.	.82	3.14	1.24	.75	.85
	C18	There are reminders (photographs, drawings etc.) of the past of the institution.	.81	3.36	1.33	.78	.83
	C19	There are information and anecdotes belonged to noteworthy persons of the school.	.77	3.28	1.41	.72	.86
	Sub-scale averages			3.27	1.31	.75	.85

We listed teachers' learning activities and implemented exploratory factor analysis on totally 11 items. Then we had two sub-scales: Individual learning sub-scale consisted of seven items (e.g., *I regularly read professional literature.*) revealing teachers' individual initiatives to learn ( $\alpha=.82$ ). Collective learning sub-scale ( $\alpha=.77$ ) included four items (e.g. *Teachers in this school share knowledge, experience and materials with their colleagues.*) referring to professional development about the whole school. So, a teacher had two different learning preference scores at different degrees.

iii) In this study, we considered the school culture as a concept encompassing the organizational features of the school. We used the *School Culture Scale*, which was originally developed by Güçlü, Yıldırım, and Daşcı (2016). It has four point Likert type 28 items under five dimensions (positive climate, innovativeness, symbols, student oriented, rules oriented). Its internal consistency score was .95. Organizational culture is a comprehensive concept consisting organizational climate and ethos (Glover & Coleman, 2005; Schein, 2010). The main indicators of *positive climate* are cooperation, solidarity, trust and sincerity among members that might affect cooperative learning in a school (Hoy & Miskel, 2012). *Student Oriented*: The most prominent side of the school is teaching and learning activities. Students are the important part of a school organization. Recent educational reforms put ahead of Student oriented practices. This perspective requires teachers to develop professionally themselves that means, in turn, they have to learn new skills (Kent, 2005; Şişman, 2011). *Task Oriented*: Responsibilities, authorities and tasks are important structural matters of an organization. School culture includes organizational structures and processes. *Symbols and values* are indicators of having school wide common values (Schein, 2010). Above mentioned scale was employed for this study and we had four dimensions. Considering their items, we named them as follows: School climate (e.g. *People in this school mostly experience joyful. compassion and courtesy.*) (Eight items,  $\alpha=.90$ ), student oriented practices (e.g. *Teachers in this school behave considering students' well-being.*) (Five items,  $\alpha=.84$ ), task oriented practices (e.g. *Teachers put emphasis on carrying out the responsibilities as they are scheduled.*) (Four items,  $\alpha=.87$ ) and symbols-values (e.g. *There are information and anecdotes around that belonged to noteworthy persons of school in the past.*) (Four items,  $\alpha=.88$ ).

iv) Teachers' individual professional characteristics were represented by professional well-being. We used *Teachers' professional well-being scale*, which was developed by Yıldırım, Arastaman, and Daşcı (2015), to collect data about teachers' professional features. The scale included seven point Likert type 21 positive items under four sub-dimensions. Its dimensions were self-efficacy, aspiration, recognition and cooperation. Its reliability score was .90. Bandura (2001) defined *self-efficacy* concept as one's personal judgment about his/her capability to accomplish a given level of performance. It is closely

related with one's prior achievements (Tschannen-Moran & Woolfolk Hoy, 2001). Self-efficacy consistently appears as the most prominent dimension of teachers' professional well-being in prior studies (Aelterman, Engels, Petegem, & Verhaeghe, 2007; Yildirim, 2015). In addition, the existence of a positive significant relationship between self-efficacy and learning was cited (Butt & Retallick, 2002). In this study, self-efficacy enclosed the items of the autonomy (e.g. *I make own decisions related with my profession in my classroom*). *Autonomy* refers to degree that people make their decision and fulfil their actions accordingly (Yildirim, 2015). *Aspiration* refers to characteristic of motivated person who has a challenging goal and expectations. This stimulate people to perform well (Bricheno, Brown, & Lubansky, 2009; Horn, Toon, Taris, Schaufeli, & Schreurs, 2004). *Recognition* occurs in case someone else appreciate employee because of his or her good performance. It can be an award or good words from students, principals or parents. This kind of events make teachers feel professionally good (Andrews, 2011; Yildirim, 2015). We employed this scale, which we have just given brief explanation about and we identified three dimensions. Regarding their contents we named as that self-efficacy (containing autonomy) (e.g. *I have knowledge and skills to carry out my profession adequately.*) (six items,  $\alpha=81$ ), aspiration (e.g. *I have plans on professional issues that make me excited.*) (five items,  $\alpha=76$ ), and recognition (e.g. *I receive appreciations because of my professional success.*) (four items,  $\alpha=74$ ).

### **Collecting and Analysing Data**

We collected data between October and November in 2016. After obtaining the permission, we visited the schools and distributed questionnaires during the break time in teachers' room. We first gave a brief explanation about the study then we delivered questionnaires to volunteer teachers. We totally distributed 378 questionnaires but we got back 349 of them. After eliminating five improper forms (blank or same coded for all items) we had totally 344 valid forms to put them into analysis.

Before implementing the analysis, we prepared the data for analysis. We first coded proper questionnaires and entered data into SPSS 22 software programme. We checked the data in terms of outliers, duplications and missing. We identified missing data using descriptive statistics and replaced them with series mean. Changes did not exceed .02 of all data. Then, we computed mahalanobis distances to reveal outliers and we cleared totally four cases because their scores exceeded the limit (24.32 for seven independent variables) (Seçer, 2015; Tabachnick & Fidell, 2013). The duplication test did not produce any duplicated case. In addition, we checked the multicollinearity and we examined VIF (Variance Inflation Factor) values ( $1.56 < VIF < 2.89$ ) which indicate no multicollinearity. We computed Pearson correlation coefficients ( $r$ ) to see the correlations among variables. Because coefficients ranged between .13 and .64, which satisfies to the requirement for logistic regression. Teachers' learning preference has significant and moderate relationships ( $.32 \leq r \leq .53$ ) to the independent (predictor) variables.

We finally analysed data of 340 participants. We performed descriptive analysis techniques (f, M, SD), item-total analysis, exploratory factor analysis (EFA: principal component, varimax rotation) and binary logistic regression (enter method).

Based on the EFA scores, we had two learning preference scores namely individual learning (IL) and collective learning (CL). For each learning preference, we implemented two-step clustering analysis separately and we transformed them into two categorical (low and high level) variables. Cluster analysis provides classification of cases into groups where group membership is not known. Cluster analysis develops groups on the basis of similarities among cases (Tabachnick & Fidell, 2013). We coded sub-categories of discrete variables as "0" for low level and "1" for high level.

Logistic regression analysis able to produce a regression model without satisfying the assumptions of normality, continuity, co-variance and multi-variable normality. In logistic regression analysis, predictors interactively exert their impacts on predicted variable. For this study, as we had two sub-categorical predicted variables, we performed the *binary logistic regression* technique and we preferred direct type (enter), in which all predictors in the model enter the equation simultaneously (Tabachnick & Fidell, 2013). We tested mainly two different predictors set on predicted variables. At the



first step, we examined the impact of *demographic variables* then, we tested the effect of *professional characteristics*. We had six demographic (discrete) variables and seven professional (continuous) predictor variables. Demographic variables contained both *individual demographic variables* (gender, total experience, and experience at current school) and *school demographic variables* (school size, school level and school's SES). Before implementing the tests, we recoded demographic variables because binary logistic regression requires defining one of the categories as reference category. We selected first category as reference for all categorical variables, therefore they were recoded with "0" and others with "1". For instance, we recoded gender as 0: female and 1: male. Professional variables consisted *individual professional variables* (self-efficacy-autonomy, aspiration, and recognition) and *school professional variables* (climate, student oriented practices, task oriented practices and symbols-values). Figure 1 displays the model tested in the study.

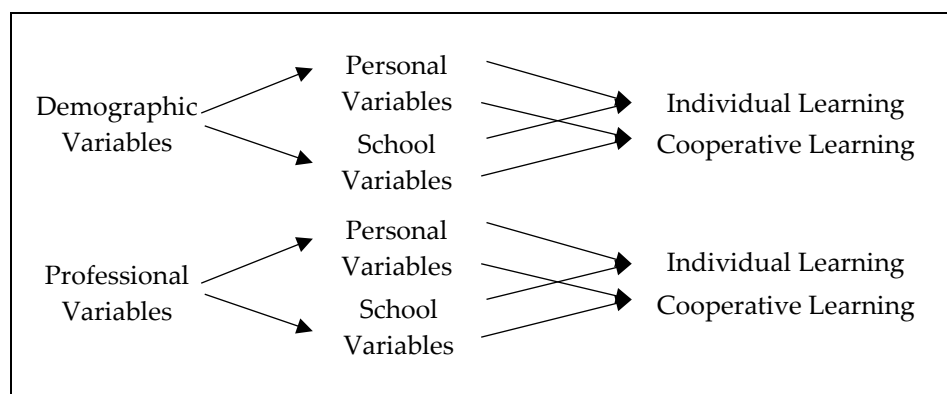


Figure 1. The Model of Analysis

We performed all analysis at individual level using SPSS version 22.0. When interpreting the continuous scores, we considered the following ranges: Between 1.00-1,80 as 1 (Very low); between 1.81-2.60 as 2 (Low); between 2.61-3.40 as 3 (Moderate); between 3.41-4.20 as 4 (High) and between 4.21-5.00 as 5 (Very high level).

## Results

### *Teachers' Learning Preferences*

We first examined the position of teachers in terms of learning preference scores. In order to find out who are low-level or high-level individual learner or collective learner, we implemented two step clustering analysis. Then, we had two categorical subgroups. To be able to compare each other, we named and coded them as *low-level learner* (0), and *high-level learner* (1). After then, we computed the descriptive statistics. Table 3 shows the distribution of participants in terms of learning preference categories. Low and high-level learners were nearly evenly distributed; their rates were very close (52 % - 48 %). In addition, SD scores refer that cluster analysis produced homogenous groups.

Table 3. Descriptive Statistics About Teachers' Learning Preferences

Learning preferences	Level	M	SD	f	Total	%	Total
Individual learners	Low level	3,84	0,43	178,00	340,00	52,40	100,00
	High level	4,73	0,19	162,00		47,60	
Collective learners	Low level	3,73	0,39	177,00	340,00	52,10	100,00
	High level	4,67	0,23	163,00		47,90	

### The Effect of Demographic Variables

In this part, we implemented two sub-tests for IL and CL, separately. Each sub-test included six discrete predictors. Table 4 shows the results of predictive ability of demographic variables. For the IL model, predictors did not make significant contribution to the models. The Omnibus tests of model coefficients indicated the poor fit of the model. Because the significant value was bigger than .05 referring that demographic variables did not predict the teachers according to the level of IL ( $\chi^2_{IL}=8.241$ ,  $df=6$ ). The Nagelkerke  $R^2$  values (.032) indicated very small relation between dependent variable and the predictor variables. The Wald Statistics revealed that there is no predictor variable making significant contribution to the model. We first checked the p values, which should be less than .05. However, we had no significant variables for the IL model. Therefore, we decided that demographic variables are not able to distinguish teachers based on the level of IL.

**Table 4.** The Results About Predictive Ability of Demographic (Personal and Organizational) Variables

Predictor variables		$\beta$	S.E.	Wald	df	Sig.	Exp(B) $e^\beta$
Individual Learning Model	Gender	-,342	,228	2,255	1	,133	,710
	Total experience	,153	,302	,258	1	,612	1,166
	Experience at current sch.	-,364	,303	1,440	1	,230	,695
	School level	,052	,241	,047	1	,828	1,054
	School size	,817	,397	4,229	1	,040	2,265
	School SES	,111	,252	,193	1	,661	1,117
	Constant	-,575	,464	1,536	1	,215	,563
Collective Learning Model	Gender	-,173	,229	,571	1	,450	,841
	Total experience	,119	,305	,151	1	,697	1,126
	Experience at current sch.	-,547	,305	3,205	1	,073	,579
	School level	-,649	,243	7,097	1	,008	,523
	School size	,481	,384	1,567	1	,211	1,618
	School SES	,310	,254	1,485	1	,223	1,363
	Constant	,133	,456	,086	1	,770	1,143

Step 1: Variable(s) entered are gender, total experience, experience at current school, school level, school size, school SES.

Omnibus Test<sub>IL</sub>:  $\chi^2_{IL}=8.241$ ,  $df=6$ ,  $p=.221$ ; Hosmer-Lemeshow Test<sub>IL</sub>:  $\chi^2_{IL}=6.315$ ,  $df=8$ ,  $p=.612$

Omnibus Test<sub>CL</sub>:  $\chi^2_{CL}=13.666$ ,  $df=6$ ,  $p=.034$ ; Hosmer-Lemeshow Test<sub>CL</sub>:  $\chi^2_{CL}=6.720$ ,  $df=7$ ,  $p=.459$

Table 4 also contains the results about CL model, in which predictors made significant contribution ( $p=.034$ ). Demographic variables significantly predicted the teachers according to the level of collective learning preference ( $\chi^2_{CL}=13.666$ ,  $df=6$ ) and the model explained 5 % of the variation in the CL (Nagelkerke  $R^2=.05$ ). Hosmer-Lemeshow Goodness of fit test confirmed the consistency between model and the data ( $\chi^2_{CL}=6.720$ ,  $df=7$ ,  $p=.459$ ). The Wald Statistics revealed that *school level*, which was only significant predictor ( $p=.008$ ) in the model, is a factor influencing whether a teacher is a *high-level collective learner*.  $\beta$  value (-.649) indicated that at the secondary level the probability of being high level collective learner decreases. It also means that likelihood of the number of high-level collective learners in the primary education level is higher than it is in the secondary education level. When we looked at the odds ratio (.523) we can say that the probability of being high-level collective learner at the secondary level 1.91 times (1/.523) less than the probability of being low-level collective learner in primary level.

### *The Effect of Professional Variables*

We separately tested two models consisting seven continuous predictors and two categorical outcomes (IL and CL). We tested all predictors in one block to assess their predictive ability. For the both model, the significant value ( $p$ ) was .000 which confirmed the significant contribution of predictor variables in models ( $\chi^2_{IL}=150.914$ ,  $df=7$ ;  $\chi^2_{CL}=173.998$ ,  $df=7$ ). The results belonged to Hosmer-Lemeshow Goodness of fit test, which should have  $p$  value larger than .05, supported the models' goodness of fit because  $p=.196$  for IL model ( $\chi^2_{IL}=11.105$ ,  $df=8$ ) and  $p=.157$  for CL model ( $\chi^2_{CL}=11.873$ ,  $df=8$ ). That also verified the conformity between the data and the models. In addition, classification statistics showed that the model correctly classified 78.2 % of cases overall for the IL model and 79.1 % of cases overall for the CL model. The model containing all predictors was statistically significant and based on these findings we assured that the both models are able to distinguish teachers according to their learning preferences and their levels. The Nagelkerke  $R^2$  values indicated the amount of variation in the dependent variable explained by the model. These values explained the power of the relation between dependent variable and the predictor variables. Predictor variables together explained nearly 48 % of total variance in IL and 53 % of total variance in CL.

Table 5 shows the Wald statistics providing information about the importance of each predictor variables for both models. We first looked at  $p$  values whether they are less than .05 to find out statistically significant predictors.

**Table 5.** The Results About Predictive Ability of Professional (Personal and Organizational) Variables

Predictor variables		$\beta$	S.E.	Wald	df	Sig.	Exp(B) $e^{\beta}$
Individual Learning Model	Self-efficacy	,935	,393	5,663	1	,017	2,547
	Aspiration	2,486	,427	33,976	1	,000	12,015
	Recognition	,234	,240	,952	1	,329	1,264
	School climate	,240	,287	,703	1	,402	1,272
	Student oriented practices	1,035	,359	8,334	1	,004	2,816
	Task oriented practices	-,546	,347	2,473	1	,116	,579
	Symbols&values	-,164	,153	1,148	1	,284	,849
	Constant	-18,555	2,130	75,882	1	,000	,000
Collective Learning Model	Self-efficacy	,856	,409	4,383	1	,036	2,354
	Aspiration	1,247	,399	9,778	1	,002	3,480
	Recognition	,477	,254	3,539	1	,060	1,612
	School climate	,619	,306	4,099	1	,043	1,857
	Student oriented practices	,938	,372	6,357	1	,012	2,554
	Task oriented practices	,580	,330	3,089	1	,079	1,787
	Symbols&values	,141	,150	,893	1	,345	1,152
	Constant	-20,646	2,339	77,897	1	,000	,000

Step 1: Variable(s) entered are self-efficacy, aspiration, recognition, school climate, Student oriented practices, Task oriented, Symbols&values.

Omnibus Test<sub>IL</sub>:  $\chi^2_{IL}=150.914$ ,  $df=7$ ,  $p=.000$ ; Hosmer-Lemeshow Test<sub>IL</sub>:  $\chi^2_{IL}=11.105$ ,  $df=8$ ,  $p=.196$

Omnibus Test<sub>CL</sub>:  $\chi^2_{CL}=173.998$ ,  $df=7$ ,  $p=.000$ ; Hosmer-Lemeshow Test<sub>CL</sub>:  $\chi^2_{CL}=11.873$ ,  $df=8$ ,  $p=.157$

We had three significant variables for IL model: *Self-efficacy*, *aspiration* and *student oriented practices*. However, *Recognition*, *School Climate*, *Task Oriented* and *Symbols-Values* did not contribute significantly to the IL model. However, we had four significant variables for CL model: *Self efficacy-autonomy*, *Aspiration*, *school climate* and *Student oriented*.

Then we checked  $\beta$  values to understand direction and amount of the relationship. Positive  $\beta$  values indicate the amount of predictor variable that could lead to a one-unit increase in the predicted variable. Table 5 shows that all significant predictors positively influence. While  $\beta$  values give information about the relationship between predictor and predicted variables,  $e^\beta$  (odds) values provide info about relationship between sub-categories of predicted variable (Tabachnick & Fidell, 2013). Because  $e^\beta$  values refer the power of distinguishing of the predictor, we should particularly consider its score in regarding research goals. The strongest predictor for both models was *aspiration* ( $e^{\beta_{IL}}=12.015$ ;  $e^{\beta_{CL}}=3.480$ ). For this predictor variable, teachers who were individual learners, were over 11 times  $[(1-12.015) \times 100]$  more likely to be high-level learners than those who were low level learners and this predictive rate was 2.5 times  $[(1-3.480) \times 100]$  for CL model. When we considered *student oriented practices* and *self-efficacy*, these ratios ranged between 1.4 and 1.8 times. School climate was statistically significant predictor for only CL model and its power of distinguishing high-level collaborative learner from low-level ones was .85 ( $e^{\beta_{CL}}=1.857$ ).

### Discussion, Conclusion and Suggestions

The basic aim of this study was to analyse the predictors' ability of distinguishing teachers according to their level of learning preference. The probability of correctly diagnosing teachers' learning preference and determining the effect size of predictors on the outcome would enable us to understand the nature of school based learning, better.

Results showed that teachers tend to be individual learners. It is coherent with prior research results (Cameron et al., 2013; Flaschberger et al., 2013; Korthagen, 2017). For instance, Flaschberger et al. (2013) found that individual learning is more prevalent and understanding of organizational learning is limited in schools. Cameron et al. (2013) reported teachers, who learn relevant to their personal professional needs, have better motivation and effective results. Korthagen (2017) found the importance of "person" in teachers' learning. TALIS (2014) reported that some effective collaborative learning activities such as observing colleagues during teaching in classroom are very scarce. Furthermore, Cameron et al. (2013) questioned the effectiveness of teachers' collective learning activities. Teachers are generally valued their self-regulated learning rather than externally mandated learning activities (Slavit & McDuffie, 2009). Some possible reasons of being individual learners might be relevant, economic, time saver and scheduled free. However, according to Hardy (2010), the most valuable teachers' learning way involves teachers to co-construct knowledge interactively based on their own practice.

In the current study, we examined the ability of demographic and professional characteristics in distinguishing teachers according to their level of learning preferences. Demographic variables consisted of gender, total experience, school experience, school size, school level and school SES. Only one of them, *school level*, was a significant predictor of teachers' collective learning. Primary school teachers were found to be more likely collective learners in comparing their colleagues at secondary level. This result can be attributed to that understanding and practices of working as a group has been further well established at the primary level. In the current study, we did not detect the significant effect of experience, but a considerable number of studies found its significance effect on teachers' learning activities (Flores, 2005; Mawhinney, 2010; Patrick et al., 2010). While experienced teachers preferred individual learning activities but beginning teachers tend to learn collaboratively. Novice teachers learned more through talking with mentor and observing colleagues. More experienced teachers preferred reading professional literature and less learning through experimenting.

We found that teachers tend to see their individual qualifications superior to the qualifications of the group they work in. In addition, relatively low scores of school climate explain the low level of interaction among teachers at the institutional level. When we considered these two findings, we assumed that teachers individually separated themselves to higher position from the rest; as a result, they mostly prefer individual learning. It also limits sharing between teachers and searching for solutions of common problems. The other finding, as supporting also internal validity, confirmed that positive climate supports the collective learning. So, positive relationships among teachers makes it

easier for them to learn together. This result is in accordance with the results of prior studies, which revealed the necessity of collaborative culture for informal learning (Cameron et al., 2013; Jurasaitė-Harbison & Rex, 2010). For instance, Liu et al. (2016) found that, both “teacher trust” (relationship with others, caring for the well-being of each other, work attitudes) and “teacher agency” (initiative, motivation, and proactive efforts) had significant, positive direct effects on “teacher professional learning”. In this case, relatively weak group learning can be sign of the weak collaborative culture and the weak organizational learning in Turkish schools. There are some prior results supporting this assume (Demirtaş, 2010; Yıldırım et al., 2016). They found weak professional cooperation among Turkish teachers and legal arrangements oblige teachers to work together but teachers, in fact, comply with these arrangements without strong and sincere desire. Findings from the study by Çolak and Altınkurt (2017) enlighten the other side of the coin that teachers are not in a position to decide on their own professional development. This phenomenon, it can be sign as a fundamental problem for administrative bodies.

Findings indicated that *personal professional characteristics* comparatively have much more powerful effect on teachers’ learning preference rather than their *organizational professional characteristics* have. This is true not only for individual learning but also for collective learning. More specifically, having knowledge and skills to fulfill professional duties and being eager for future professional goals instead of doing activities sensitive to student needs and having a positive school climate are much more effective on collective learning. Based on this result, as mentioned by Cameron et al. (2013), we can suggest that it is necessary to broaden the area for the individual initiative of teachers in order to improve professional learning in the school. Of course, this requires supportive school leadership and positive school climate. Results of Liu et al. (2016) are in harmonious with this result that they found that teachers’ proactive efforts had a moderate direct effect on their professional learning but the direct effect of work environment was smaller. Furthermore, while mediated by teachers’ agency and trust, learning-centred leadership has a positive-meaningful effect on teachers’ professional learning. Therefore, two-intervention points appear that can motivate teachers for their individual professional learning: having challenging goals and getting knowledge and skills for reaching these goals. In order to transfer it into real life we should develop incentive mechanisms.

*Aspiration, self-efficacy* and *student oriented practices* were significant predictors for teachers’ individual learning. However, for their cooperative learning, *school climate* joined to this trio; so, *aspiration, self-efficacy, student oriented practices* and *school climate* were significant predictors. This result indicated that internal incentive mechanisms drive teachers to learn, furthermore it implied the gradually lower effectiveness of systemic arrangements for school learning. The strongest predictor for both models was *aspiration*. Job-related aspiration refers to degree to which a person pursues challenging goals in their job (Horn et al., 2004). Having a professional goal is related with aspiration and professional learning. Goal setting (personal or organizational) was defined as a source of motivation (Locke & Latham, 2002) and to be able to get the goal, learning is inevitable. According to Vansteenkiste, Lens, and Deci (2006), the intrinsic goals could promote deeper engagement in learning activities than extrinsic ones. This result is consistent with the prior results pointing out the centrality of motivation, self-efficacy and organizational support in terms of employee’ learning across different professions (Attema-Noordewier, Korthagen, & Zwart, 2011; Jurasaitė-Harbison & Rex, 2010; Kyndt & Baert, 2013). “Teachers’ willingness” was specified as core issue in teachers’ learning (Cameron et al., 2013; Kyndt & Baert, 2013; Vansteenkiste et al., 2006). However, some results indicated the poor willingness of Turkish teachers for their own professional development (Bümen et al., 2012; Özoğlu, 2010).

Self-efficacy, constructed on the achievements, was defined as “a judgement of one’s capability to accomplish a given level of performance”. It is also related with professional learning (Aelterman et al., 2007; Bandura, 2001; Korthagen, 2017; Liu et al., 2016). In the current study, self-efficacy also contained the items of autonomy and these items together were factorised under the name of self-efficacy. We found that self-efficacy is a significant predictor for both individual learning and

cooperative learning. Results related with self-efficacy confirmed the prior studies' results (Slavit & McDuffie, 2009). For instance, TALIS report (2014) explained the relationship between self-efficacy and teachers' learning at school that "In almost all countries, teachers who report participating in collaborative professional learning have at least five times greater self-efficacy." Positive relationship between self-efficacy and informal learning was reported by previous studies involving not only teaching profession but also for other professions, too (Flores, 2005; Kyndt & Baert, 2013). We also found that student oriented practices at school significantly affects teachers' learning preferences (individually and collectively). This result is consistent with the prior studies, too (Darling-Hammond & Richardson, 2009). In another saying, increasing of practices towards meeting students' needs results in increasing of teachers' learning. As stated by Hardy (2010), teachers learn for students' learning.

At the end of the study, we concluded that if teachers have a challenging professional goals and good level of self-efficacy and if they have a positive climate in school, they are highly possibly both individual and collective learners. Therefore, school administrations who are able to manage these issues are likely to achieve greater professional learning and in turn school improvement. As noted by Kock and Ellström (2011) administrators have to create enabling learning environment. In order to enhance the learning environment at school, administrations should intentionally organize collaborative groups and define challenging goals for these groups (Darling-Hammond & Richardson, 2009). Teachers' learning at the school seems to be left to teachers own choice. We need to system wide incentive mechanisms motivating and supporting teachers' aspiration.

There is a need for further researches that can examine the ways of teachers' learning and reasons stimulating teachers to learn, and they can use mix method, too. Since this study is conducted in a certain region of Turkey, the generalizability of the results is limited for other cultural contexts.

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