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Analysis of the Relationships between Academic Motivation, Engagement, Burnout and Academic Achievement with Structural Equation Modelling

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Abstract

The aim of this study was to examine the relationships between teacher candidates' academic motivations, engagements, burnouts and academic achievements with structural equation modelling. The participants of the research consisted of teacher candidates studying in the faculty of education at a state university in Eastern Turkey (n=861). The model, which was set within the research, was confirmed. 5 out of 6 hypotheses were accepted, while 1 of them was rejected. In the consequence of the research, it was determined that academic motivation predicted burnout directly and negatively; academic motivation predicted student engagement directly and positively; burnout predicted student engagement directly and negatively; burnout predicted academic achievement directly and negatively; student engagement predicted academic achievement directly and positively, on a significant level statistically. Moreover, burnout had a mediation role in the relationship between academic motivation and student engagement; student engagement had a mediation role in the relationship between burnout and academic achievement; both student engagement and burnout had a mediation role in the relationship between academic motivation and academic achievement. Academic motivation explained nearly 31% of the variance in burnout; academic motivation and burnout together explained nearly 44% of the variance in student engagement; and the confirmed model explained nearly 13% of the variance in academic achievement. Further implications of these findings for practical use and further research are discussed.

Key words: Teacher candidates, Academic motivation, Student engagement, Burnout, Academic achievement.

Introduction

Training process of individuals who will become teachers in the near future is an area which is accentuated in depth around the world and education systems give particular importance to. Teacher candidates' effort, willingness, reluctance, engagement, being innovative in the process of learning and teaching in the classroom; that is, actions in the process of improving themselves during college education are important for their teaching profession in the upcoming years. Thus, it can be expressed that teacher candidates' motivations form, support and affect their pre-service education process. Several definitions and classifications about motivation have been made in the literature. Academic motivation is one of these definitions. Academic motivation affects learning outcomes which students get in the process of education positively and contributes to reducing undesirable behaviour in educational environments (Vallerand, Pelletier, Blais, Briere, Senecal &Vallieres, 1992).

It has been revealed within the studies in the literature that academic motivation has an effect on the concepts like school attendance, reducing dropout rate, memorability of knowledge, academic achievement, fulfilling assignments and duties, researching, focus on courses, not getting bored in class, positive classroom relationships (Clark & Schroth, 2010; DiPerna & Elliott, 1999; Eccles & Midgley, 1990; Litalien, Morin, Gagné, Vallerand, Losier & Ryan, 2017; Wormington, Corpus & Anderson, 2012), enjoying learning (Eccles & Wigfield, 2002; Zimmerman, 2008), student engagement (Green, Liem, Martin, Colmar, Marsh & McInerney, 2012, Roeser, Strobel & Quihuis, 2002, Doğan, 2015), burnout (David, 2010; Chang, Lee, Byeon, Seong & Lee, 2016; Veyis, Seçer & Ulas, 2019) and academic achievement (Guay, Ratelle, Roy & Litalien, 2010, Rodriguez, Castillo & Gandara, 2013).

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Academic motivation has been defined by Bozanoglu (2004) as producing necessary energy for academic duties and affairs. Motivation of students in general view and academic motivation of students in special view play a critical and important role in educational environments and processes. Academic motivations of students are affected by various factors. Many factors like teachers' classroom management, supporting students, relationships with students, the use of rewards and punishment in classroom, classroom climate, students' perceptions of self-efficacy, focus on goals, friend relationships and supports affect academic motivations of students (Rowell & Hang, 2013). It can be stated that motivation of students in all education levels from pre-school to college has positive contributions to educational process. Within the context of this study, various examinations and discussions have been made in terms of positive contributions of teacher candidates' motivation to educational process and reducing negative cases in educational process.

Another variable discussed within the research is student engagement. It has been discovered within the studies that student engagement has an effect on various educational variables. The studies on student engagement discussed observable aspects of engagement previously, but the following studies tried to explain student engagement in more detail by focusing on affective aspects of engagement (Brophy, 1983; Connell & Wellborn, 1991; Finn, 1989). The recent studies discussed engagement as a multidimensional concept (Fredricks, Blumenfeld & Paris, 2004). Behavioural engagement focused on observable aspects of student's engagement in educational processes like following classroom rules, class attendance, active participation in the learning process and fulfilling duties and responsibilities (Finn, Pannozzo & Voelkl, 1995;Walker, Greene & Mansell, 2006). Affective engagement can be defined as combination of feelings for teachers, friends and school like belonging, identification, value, happiness, interest, sadness and anxiety (Connell & Wellborn, 1991; Finn, 1989). Cognitive engagement refers cognitive processes student uses in classroom such as problem solving, organizing knowledge and signifying knowledge (Brophy, 1987; Connell & Wellborn, 1991; Li & Lerner, 2013).

Increasing student engagement affects some variables like academic achievement (Reyes, Brackett, Rivers, White & Salovey, 2012; Storlie & Toomey, 2020), reducing undesirable behaviour (Nelson, 2015), reducing alienation (Wimpenny & Savin-Baden, 2013), reducing level of burnout (Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002), academic effort, motivation, reducing dropout rate (Alexander, Entwisle & Kabbani, 2001; Buhs & Ladd, 2001; Fredricks, Blumenfeld & Paris, 2004; Lam et al., 2014) and positive attitude towards school and learning (Chiu,Pong, Mori & Chow, 2012; Sever, Ulubey, Toraman & Türe, 2014).

It has been determined within the studies in the literature that student burnout has a negative effect on educational processes and academic achievement (Salmela-Aro & Upadyaya, 2017). Student burnout is described as student exhaustion due to studying hard and academic demands, perception of underachievement, negative attitude towards school and school activities and emergence of feeling of incompetence and development (Lee, Puig, Kim, Shin, Lee & Lee, 2010; Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009). Burnout from students' point of view is to feel exhausted due to studying demands and to feel incompetent themselves (Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002). Student burnout can be defined as syndrome showing students' exhaustion, getting themselves stressed of students about school, and duties and responsibilities related to school and state of exhaustion caused by pressure (Aypay, 2012). It can be stated that college students in general view, teacher candidates in special view get exhausted because of various reasons such as future anxiety, beginning to work, projects, duties, keeping away from family, improving themselves, friend relationships and economic problems.

It has been revealed within the studies in the literature that student burnout causes many negative outcomes from an educational perspective. These are decline in academic achievement (Çapulcuoğlu & Gündüz, 2013; Salmela-Aro, Savolainen & Holopainen, 2009), lack of motivation for classes and school (McCoach & Siegle, 2001; Reis & McCoach, 2000), developing negative attitude towards classes and school (Salmela-Aro, Savolainen & Holopainen, 2009), decline in academic self-efficacy (Lee, Puig, Kim, Shin, Lee & Lee, 2010), increase in school dropout rates (Yang & Farn, 2005), increase in school absenteeism (Kutsal, 2009) and decline in student engagement (Fiorilli, De Stasio, Di Chiacchio, Pepe & Salmela-Aro, 2017). According to the results of the studies, it can be stated that burnout affects especially student engagement and academic achievement. Moreover, it can be remarked that increasing student motivation reduces student burnout.

Academic achievement provides an opportunity to make various comparisons about education in national and international context and to evaluate outcomes of educational systems, so it is an important concept in planning and performance of educational processes. Academic achievement can be defined as level of students' goal achievement in an educational institution like school (Aduke, 2015). Academic achievement is individual's performing specific objectives designed specially in a structured environment like university in a desired

competence and level as performance outcomes (Steinmayr, Meißner, Weidinger & Wirthwein, 2015). Academic achievement is affected by many factors based on individual and environment (Atik & Özer, 2020). In the consequence of the studies conducted with teacher candidates, some factors affecting their academic achievement are these: motivation (Eymur & Geban, 2011; Wurf & Croft-Piggin, 2015), student engagement (Castro-Villarreal, Guerra, Sass & Hseih, 2014; Daniels, Radil & Goegan, 2017) and burnout (Balkıs, 2013).

College years are an important period for teacher candidates, in which they acquire professional knowledge and skills for professional development. Teacher candidates mainly acquire theoretical knowledge and contribute to their professional development with applied courses in this period. On the other hand, they contribute to their personal development by socializing. A qualified pre-service training is important for teacher candidates to overcome the problems they will encounter in the early years of the profession and to continue their professional career. An important indicator that teacher candidates have acquired sufficient knowledge and skills related to their profession is their academic achievements. The factors affecting the academic achievements of students at different school levels have an extensive research literature, but the variables of academic motivation, school engagement and burnout that can affect the academic achievements of teacher candidates have been discussed together in a limited number of studies (Cazan, 2014; Wen et al., 2014). Modeling variables that may affect the academic achievements of teacher candidates will contribute to the determination of the content of intervention programs that can be developed for teacher candidates during their university education and thus to the quality of teacher preparation programs.

Hypotheses of the researcher were developed and structural equation modelling was set and drawn in the light of abovementioned literature and the statistical findings of these studies were utilized. Within the scope of this research, the relationships between academic motivation, school engagement, burnout and academic achievement were investigated with structural equation modelling.

H1: Academic motivations of teacher candidates have a negative effect on their burnouts.
H2: Academic motivations of teacher candidates have a positive effect on their engagements.
H3: Burnouts of teacher candidates have a negative effect on their engagement.
H4: Burnouts of teacher candidates have a negative effect on their academic achievements.
H5: Academic motivations of teacher candidates have a positive effect on their academic achievements.
H6: Teacher candidates' engagements have a positive effect on their academic achievements.

Method

Research model

This research is a relational study determining the relationships between teacher candidates' academic motivations, engagements, burnouts and academic achievements. Structural Equation Modelling, one of the analysis methods used in relational studies to determine relationships between variables (Fraenkel & Wallen, 2009), was used within the scope of the research.
Structural equation modelling is a statistical technique showing and testing relationships between one or more than one dependent variable, or one or more than one independent variable all together (Tabacknick & Fidell, 2013).

Participants

The research was conducted with voluntary students studying in the faculty of education at a state university in Eastern Turkey in the 2018-2019 academic year. The final analyses of the research were performed with data gathered from 861 students. Among these students, 609 (70.7%) of them were female, while 252 (29.3%) of them were male and 185 (21.5%) of them were sophomore students, 318 (36.9%) of them were junior students, while 358 (41.6%) of them were senior students.

Data collection tools

Data collection tools consisting of four parts as demographic information (gender, grade level, CGPA= Cumulative Grade Point Average), Academic Motivation Scale, College Students Engagement Scale and Maslach Burnout Inventory- Student Form was used in the study. The scales in the data collection tools were explained below.

Academic Motivation Scale

The Academic Motivation scale, used in order to determine motivations of students studying in faculty of education, was developed by Bozanoğlu (2004). The scale was developed for high school students and also used for various studies concerning college students (Demir & Arı, 2013; Terzi, Uyangör & Dülker, 2017). This scale contains sub-dimensions of "Getting over Oneself", "Using Knowledge" and "Discovery" and 20 items in total. The scale's validity and reliability checks were performed again within the context of the research. Second-order confirmatory factor analysis was performed for the scale and according to the analysis results, the values of goodness-of-fit were these: $\chi 2/df=2.81$, GFI=0.96, AGFI=0.95, NFI=0.96, NNFI/TLI=0.96, IFI=0.95, CFI= 0.97, RMSEA=0.021, RMR=0.034, SRMR=0.039. Cronbach's alpha internal consistency coefficients for the sub-dimensions of "Getting Over Oneself", "Using Knowledge" and "Discovery" and for the whole scale were "0.81", "0.84", "0.84" and "0.82" respectively.

College Students Engagement Scale

This scale was developed by Özer & Atik (2014). The scale consisted of one dimension and 11 items. The fit indices of the confirmatory factor analysis for this scale were these: $\chi 2/df=2.24$, GFI=0.96, AGFI=0.95, NFI=0.97, NNFI/TLI=0.96, IFI=0.96, CFI= 0.96, RMSEA=0.026, RMR=0.034, SRMR=0.028. Cronbach's alpha value of this scale was .90.

Maslach Burnout Inventory- Student Form

Maslach Burnout Inventory- Student Form (MBI-SF), developed by Schaufeli, Martinez, Marques-Pinto, Salanova & Bakker (2002), was adapted to Turkish by Çapri, Gündüz & Gökçakan (2011). The scale had a 3 sub-dimensional structure consisting of 13 items in total. These sub-dimensions were named as "burnout (5 items)", "desensitization (4 items) and "competence (4 items). Second-order confirmatory factor analysis was performed for the scale and according to the analysis results, the values of goodness-of-fit were these: $\chi 2/df=2.52$, GFI=0.94, AGFI=0.93, NFI=0.94, NNFI/TLI=0.94, IFI=0.95, CFI= 0.95, RMSEA=0.039, RMR=0.044, SRMR=0.048. Cronbach's alpha internal consistency coefficients for the sub-dimensions of "Burnout", "Desensitization" and "Competence" and for the whole scale were "0.79", "0.81", "0.77" and "0.79" respectively.

Process and Data Analysis

Data of the research were gathered in the spring semester of the 2018-2019 academic year. The data collection process was applied based on voluntariness. Filling out the scale took 15 minutes on average. The students entered the student information system to learn their grade point averages while filling out the data collection tool. The students were asked to write their current cumulative grade point average (CGPA) into data collection tool. Univariate and multivariate normal distributions of the dataset were checked to conduct structural equation modelling. The results of the analysis are shown in Table 1.

Table 1. Multivariate normality analyses

Variable	Coefficient of Skewness	c.r.	Coefficient of Kurtosis	c.r.
Academic Motivation	-.281	-.365	.172	1.029
Burnout	.346	.149	-.168	-
Student Engagement	-.605	-.253	.294	1.762
Academic Achievement	-.383	-.588	-.246	-
Multivariate			.897	1.899

[c.r.: critical ratio]

At first, univariate normal distribution assumptions (Z scores between +3 and -3 and skewness and kurtosis values between +1 and -1 were selected as the baseline) were checked for the research analyses. It has been determined as a result of the analyses that the dataset is in accordance with univariate normality assumptions. When univariate normality assumption was examined for the dataset, it was accepted as a reference point that skewness and kurtosis values were between +1 and -1 as Şencan (2005) suggested. They were taken as reference points in multivariate normality analyses that multivariate kurtosis value was between +2 and -2, and multivariate critical ratio value was less than 1.96 (Bayram, 2010). It was determined as a result of the analyses

that the dataset was in accordance with both the univariate and the multivariate normality assumptions. Maximum likelihood method in SPSS- AMOS 21 program was used in the process of data analysis.

Findings

Descriptive statistical analysis of the variables was conducted in the first analysis step of the research data. Results of the analysis are shown in Table 2.

Table 2. The results of the descriptive analysis

	$\bar{x}$	sd	1.	2.	3.
1. MOT	3.32	11.37			
2. BUR	2.60	1.71	-.56		
3. ENG	3.72	6.76	.64	-.50	
4. AA	2.82	2.46	.14	-.30	.31

(MOT: Academic Motivation, BUR: Burnout, ENG: Student Engagement, AA: Academic Achievement)

According to the correlation analysis results in Table 2, it is seen that the means of the variables vary between 2.60 and 3.72, and the standard deviation values vary between 2.46 and 11.37.

As a result of the correlation analysis, it has been found that there is a negative, medium level, significant relationship between students' academic motivations and their burnouts (r=-.56; p<.001); a positive, medium level, significant relationship between their academic motivations and their engagements (r=.64; p<.001) and a positive, small level, significant relationship between their academic motivations and their academic achievements (r=.14; p<.001). It has been determined that there is a negative, medium level, significant relationship between burnout and student engagement (r=-.50; p<.001); a negative, medium level, significant relationship between burnout and academic achievement (r=-.30; p<.001). It has been revealed that there is a positive, medium level, significant relationship between student engagement and academic achievement (r=.31; p<.001).

The model, set based on the theoretical knowledge of the research, was analyzed with AMOS 21 program. Standardized regression coefficients and significance levels of regression coefficients of the analysis and the hypotheses of the research are shown in Table 3.

Table 3. Hypotheses of the research and analysis results of the model

Hypotheses	Pathways Between Variables			B	β	t-value	Result
H1	BUR	<---	MOT	-.09	-.56	19.83	Accepted
H2	ENG	<---	MOT	.31	.53	17.06	Accepted
H3	ENG	<---	BUR	-.77	-.20	6.63	Accepted
H4	AA	<---	BUR	-.05	-.19	5.92	Accepted
H5	AA	<---	MOT	.04	.03	1.79	Rejected
H6	AA	<---	ENG	.019	.22	6.63	Accepted

(MOT: Academic Motivation, BUR: Burnout, ENG: Student Engagement, AA: Academic Achievement)

When Table 3 is examined, it is seen that five pathways in the model are significant (p<.05), but the pathway between academic motivation and academic achievement is insignificant (p>.05). Among the hypotheses, developed in the context of this research, 5 out of 6 hypotheses were accepted, and 1 of them was rejected. Goodness-of-fit values obtained from the analysis are shown in Table 4.

Table 4. Goodness-of-fit index results of the confirmed model

Fit Index	**Acceptable Fit**	**Good Fit**	**Goodness-of-fit Values Obtained from the Research**
$\chi 2/df$	$2 \leq \chi 2/df \leq 5$	$0 \leq \chi 2/df < 2$	0.98 (Good Fit)
GFI	$0.90 \leq GFI < 0.95$	$0.95 \leq GFI \leq 1.00$	0.99 (Good Fit)

AGFI	0.85 ≤ AGFI < 0.90	0.90 ≤AGFI ≤ 1.00	0.99 (Good Fit)
NFI	0.90 ≤ NFI < 0.95	0.95 ≤ NFI ≤ 1.00	0.99 (Good Fit)
NNFI/TLI	0.95 ≤ NNFI < 0.97	0.97 ≤ NNFI ≤ 1.00	0.98 (Good Fit)
IFI	0.90 ≤ IFI < 0.95	0.95 ≤ IFI ≤ 1.00	0.99 (Good Fit)
CFI	0.95 ≤ CFI < 0.97	0.97 ≤ CFI ≤ 1.00	0.99 (Good Fit)
RMSEA	0.05 ≤ RMSEA ≤ 0.08	0 ≤ RMSEA < 0.05	0.03 (Good Fit)
RMR	0.05 ≤ RMR ≤ 0.08	0 ≤ RMR <0.05	0.04 (Good Fit)
SRMR	0.05 ≤ SRMR ≤ 0.08	0 ≤ SRMR < 0.05	0.01 (Good Fit)

(Brown, 2006; Çelik & Yılmaz, 2013; Kline, 2010; Sümer, 2000; Şimşek, 2007).

Fit indices in respect of the structural equation modeling are shown in Table 4. The values of χ2/df (0.98), GFI (0.99), AGFI (0.99), NFI (0.99), NNFI/TLI (0.98), IFI (0.99), CFI (0.99), RMSEA (0.03), RMR (0.04) and SRMR (0.01) are regarded as "Good Fit". The model, confirmed by the analyses in the research, is shown in Figure 1.

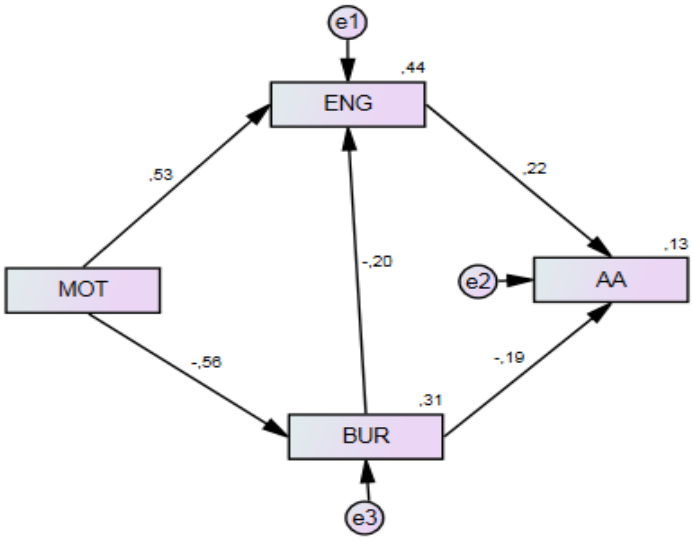

Figure 1. Confirmed structural equation modeling

According to the confirmed model, academic motivation (MOT) predicts burnout (BUR) directly and negatively (β=-.56); academic motivation (MOT) predicts student engagement (ENG) directly and positively (β=.53); burnout (BUR) predicts student engagement (ENG) directly and negatively (β=-.20); burnout (BUR) predicts academic achievement (AA) directly and negatively (β=-.19) and student engagement (ENG) predicts academic achievement (AA) directly and positively (β=.22), on a significant level statistically.

Academic motivation (MOT) explains nearly 31% of the variance in burnout (BUR); academic motivation (MOT) and burnout (BUR) together explain nearly 44% of the variance in student engagement (ENG); three variables (MOT, BUR, ENG) altogether explain nearly 13% of the variance in academic achievement (AA). The direct and indirect effects, standardized for the variables in the structural equation modeling, are shown in Table 5.

Table 5. Bootstrap analysis results of the effects in the confirmed model

Pathways	Bootstrap values		Bias %95 CI**	
	Coefficient	SE*	Lower Limit	Upper Limit
Direct effect				
MOT → BUR	-56	.02	-.59	-.51
MOT → ENG	.52	.03	.48	.59
BUR → ENG	-.20	.03	-.26	-.15
BUR → AA	-.19	.04	-.26	-.14
ENG → AA	.22	.04	.15	.28
Indirect effect				

MOT → ENG	.11	.02	.08	.14
MOT → AA	.10	.02	.08	.13
BUR → AA	-.05	.01	-.06	-.03

*Standard Error, ** Confidence Interval

When bootstrapping coefficients and their confidence intervals are examined in Table 5, it is understood that the direct and indirect pathways are significant. Besides, burnout (BUR) has a mediation role in the relationship between academic motivation (MOT) and student engagement (ENG). Student engagement (ENG) has a mediation role in the relationship between burnout (BUR) and academic achievement (AA). Both student engagement (ENG) and burnout (BUR) have mediation roles in the relationship between academic motivation (MOT) and academic achievement (AA).

Results, Discussion and Recommendations

This research is one of the limited number of studies analyzing the relationships between teacher candidates' academic motivations, engagements, burnouts and academic achievements all together. The model, developed based on theoretical and statistical findings of the literature, was confirmed in the consequence of the research. From this point of view, it can be expressed that the research provides more detailed analyses by discussing teacher candidates' college education process extensively. It has been determined within this research that teacher candidates' academic motivations have a negative significant effect on their burnouts. It has been revealed in the studies in the literature that student motivations support educational process in a positive way. It can be also remarked that motivation reduces problems in educational processes. Pisarik (2009) stated that increasing students' motivations reduce their burnouts. Other studies in the literature supported this result of the research (Chang, Lee, Byeon, Seong & Lee, 2016; Veyis, Seçer & Ulas, 2019). Moreover, it can be said that teacher candidates' academic motivations affect their improving themselves positively when they become teachers in the near future (Altınkurt, Yılmaz & Erol, 2014). Within the context of the research, academic motivation explains nearly 31% of the variance in teacher candidates' burnouts which they will suffer from in the future.

It has been determined within the research that teacher candidates' academic motivations have a positive effect on their engagements. This result of the research shows parallelism with the other studies in the literature (Jang, 2008; Guthrie, Klauda & Ho, 2013). Students' motivations for the class and educational process cause reducing undesirable behaviour (Petlák, Tistanová & Juszczyk, 2019), developing a positive attitude towards school and learning (Ganbari-Taleb, Ghanbari, Yousefi & Botlani, 2013; McCoach, 2002), focusing on assignments and duties (Katz, Kaplan & Gueta, 2009), active participation in educational process in classroom (Jang, 2008), helping peer teaching (Keifer, Alley & Ellerbrock, 2015), improving themselves (Chirkov, Vansteenkiste, Tao & Lynch, 2007; Noels, Clément & Pelletier, 1999), enjoying learning (Abrams, 2005; Benson, 2003), reducing dropout rate (Vallerand, Fortier & Guay, 1997), teacher burnout (Shen, McCaughtry, Martin, Garn,Kulik & Fahlman, 2015), student burnout (Stoeber, Childs, Hayward & Feast, 2011) and increasing academic achievements (Alivernini & Lucidi, 2011; Meece, Anderman & Anderman, 2006).

It has been revealed within this research that teacher candidates' burnouts have a negative effect on their engagements. The results obtained from other studies in the literature support the result of this research (Alarcon, Edwards & Menke, 2011; Fiorilli, De Stasio, Di Chiacchio, Pepe & Salmela-Aro, 2017; Uludag & Yaratan, 2010). It has been discovered by the studies that burnout affects individual's both student life and normal life in a negative way (Maslach, Jackson, Leiter, Schaufeli & Schwab,1986; Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009). From this point of view, it can be said that teacher candidates' burnouts affect their college education, their improving themselves for their school teaching in the future, enjoying their lives and achieving satisfaction with life in a negative way.

Increasing teacher candidates' motivations and energies for educational process contributes to reducing their burnouts (Alarcon, Edwards & Menke, 2011). Thus, things to do in order to increase positive energy of students in general view, of teacher candidates in special view in the educational process and reduce their burnouts are these: making students feel valuable and special, supporting their efforts in educational process, taking care of their problems and helping them solve their problems, designing lessons according to student needs and levels, enabling them active participation in the learning process, developing understanding of lifelong learning instead of the idea that education and learning take place only in schools, making them realize that successes and failures are parts of human life, raising awareness of students about the factors reducing parental, peer and social pressure, guiding them through activities enabling them to have a fun and quality time. In the consequence of the research, academic motivation and burnout together explain nearly 44% of the variance in teacher candidates' engagement.

It has been found within the research that teacher candidates' engagements have a positive effect on their academic achievements. This finding of the research shows parallelism with the other studies in the literature (Collie, Holliman & Martin, 2017; Heng, 2014; Reyes, Brackett, Rivers, White & Salovey, 2012). It can be stated that engagements of students in general view, of teacher candidates in special view have positive contributions to their participation in class debates, their efforts to participate in educational activities in class, their interests and motivations for learning (Fredricks, Blumenfeld, & Paris, 2004; Marks, 2000). It can be expressed that reducing student engagement causes increasing undesirable behaviour in educational environments, reducing the level of achieving goals and academic achievements, increasing dropout rate and alienation from school, and increasing student burnout (Archambault, Janosz, Fallu & Pagani, 2009; Kaplan, Peck, & Kaplan, 1997; Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009). It can be said that Turkey will go on caring about and using instructional programmes providing students' active participation in learning in the upcoming years thanks to tendencies in educational sciences, changes and transformations in education around the world. Thus, it is possible to say that teacher candidates' engagements in pre-service education processes, and experiences about how to encourage students' engagement and which strategies should be followed are important in terms of the teaching profession. It can be stated that teacher candidates in the university see their professors' behaviours affecting student engagement positively or negatively as a role model in the context of social learning theory.

It has been determined within the research that teacher candidates' burnouts have a negative effect on their academic achievements. This result of the research bears a resemblance to the results of other studies conducted by Duru, Duru & Balkıs (2014), Vasalampi, Salmela-Aro & Nurmi (2009) and Yang (2004). Academic achievement can be regarded as a premise to evaluate effectiveness and productivity of schools and education systems, and to follow if the educational goals have been achieved or not (Balcı, 2013; Hoy & Miskel, 2010; Lunenburg & Ornstein, 2013). Academic achievement and the factors affecting academic achievement were discussed in many studies. Intense studies on academic achievement show the importance of the concept for the educational process. It can be expressed that courses teacher candidates took in faculties of education are for increasing their mastering the field, their general knowledge and their pedagogical content knowledge, and adopting the teaching profession. Teacher candidates' successes in these courses enable them to improve themselves in teaching.

The hypothesis, teacher candidates' academic motivations have a direct positive effect on their academic achievements, has not been confirmed. However, when the research results are evaluated it can be said that teacher candidates' academic motivations have an effect on their academic achievements even if it is indirect. This result of the research bears a resemblance to the results of other studies in the literature (Clark, Middleton, Nguyen & Zwick, 2014; Guay,Ratelle, Roy & Litalien, 2010). The results of the research have shown the importance of students' motivations, engagements and burnouts in terms of their academic achievements. Three variables discussed within the research (academic motivation, engagement and burnout) altogether explain nearly 13% of the variance in academic achievement. It is possible to say that this variance explanation is an important result for academic achievement which is a concept affected by many factors. These suggestions can be offered based on the results of the research:

- This research was conducted based on quantitative techniques. Further studies using mixed designs in order to remove this limitation of the research can contribute to evaluating the results of the research better.
- Conducting this research in various universities in Turkey and in the world can contribute to comparing the research results.
- Educational applications affecting teacher candidates' academic and general motivations positively can be increased.
- In order to reduce teacher candidates' burnouts, some measures can be taken such as making the educational process pleasant and entertaining, determining the factors causing stress and burnout in teacher candidates and reducing these factors.
- It is possible to say that making arrangements for examinations and practices causing pressure on teacher candidates during teacher appointment process can reduce their burnouts.
- Awareness of professors who instruct and play a key role in teacher candidates' engagements can be raised by providing training for them on this topic.
- Direct relationships between the variables were analyzed in this research. Moreover, further studies for indirect effects can contribute to clarifying and evaluating this research.

It can be said that this research has some limitations. First of all, since this study focused on personal variables that affect teachers' academic achievements, environmental factors that may affect academic achievement were not included in the model. Adding environmental factors that can affect academic achievement to the model could have increased the variance explained by the model. Second, the sample of the research is limited to teacher candidates studying at a state university in eastern Turkey. Thus, this situation creates a limitation in the generalization of the research results. Finally, teacher candidates' academic motivation, school engagement and burnout levels were determined based on their individual perceptions. This situation is considered as a limitation as it may affect the objectivity of the answers given to the scale questions.

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