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The Study Approaches as The Predictors of Academic Self-Efficacy and Teacher Efficacy: A Study in Pedagogical Formation Students

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Abstract

Aim: This study aims to determine study approaches of students taking pedagogical formation from different departments, examine academic and teacher self-efficacy beliefs, find out the role of these factors in academic achievement and compare students in physical education and sport and students in the different field.

Methods: 515 pedagogical formation students studying in the departments of physical education and sport, history, mathematics, graphic, philosophy, painting, music, business, contemporary Turkish dialects, Turkish philology, food and beverage management, biology, nutrition and dietetics, aquaculture, physics, nursing, English philology, hospitality management and sociology participated in this study. Academic self-efficacy scale, developed by Jerusalem and Schwarzer (1981), adapted to Turkish by Yılmaz, Gürçay and Ekinci (2007) was used to determine academic self-efficacy beliefs. Study Process Questionnaire, developed by Biggs, Kember, and Leung (2001) and adapted to Turkish by Yılmaz and Orhan (2011) was used to determine study approaches. Ohio Teacher Self-Efficacy Scale, developed by Tschannen-Moran & Woolfolk-Hoy, adapted to Turkish by Baloğlu and Karadağ (2008), was used to determine teacher self-efficacy beliefs. Collected data was analyzed in SPSS, path analysis in AMOS.

Results: Significant differences were found between genders regarding surface approach (SA) and surface motivation (SM). A significant difference was found between genders regarding academic self-efficacy. A significant difference was found between students according to their general academic averages (GAA) regarding academic self-efficacy (ASE), teacher self-efficacy (TSE) and study approaches (SA). Moreover, positive correlations were found between GAA, deep approach (DA) and TSE while negative correlation was found between surface approach (SA) and TSE, DA, GAA. Students in physical education and sports department reported higher scores than the others regarding surface approach.

Conclusion: The analysis related to hypothesized model showed that study approaches had an impact on general academic average that had a role in increasing academic self-efficacy, correspondingly teacher self-efficacy beliefs increased.

Keywords
Self-Efficacy,
Study Approaches,
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Physical Education,

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INTRODUCTION

Learning types and academic beliefs system are defined as factors contributing to academic achievement (Cassidy & Eachus, 2000). The approaches of an individual toward learning, accordingly toward studying, can have impacts on the processes and perceptions related to academic achievement. When looked from the viewpoint of educational research, the most significant contribution to the conceptualization process of the learning and studying approach has been made by Marton and Säljö (1976) who developed the concepts of "deep and surface approaches." While a student adopting deep approach seeks meaning, interests the subject itself, tries to find a connection between ideas, the surface approach is more about memorizing and the fear of failure (Juklová, Doležalová, Vrabcová & Nowosad, 2015). Additionally, Entwistle and Waterson (1985), Ramsden (1988) have conceptualized "strategic approach" which is related to a student's purpose to have the possible high grade. Biggs (1999) stated, "academic students will adopt a deep approach to learning in their major subjects, often despite their teaching, while non-academic students are likely to adopt a deep approach only under the most favorable teaching conditions." The same student can display different approaches in different conditions (Richardson, 2008). According to Richardson (2011), when students' perception of academic environment mediates the conxtectola factors having the impact on the approaches, there should be a relationship between academic context and the study approaches.

In literature, there are some studies explaining the relationship between academic achievement and approaches to learning and studying (Elliot, McGregor & Gable, 1999; Salamonson, Weaver, Chang,

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Koch, Bhathal et al., 2013). Furthermore, there is evidence showing that the approaches to learning and studying affect self-efficacy (Phan, 2007; Phan, 2011; Azzi, Casanova, Dantas & de Medeiros Maciel, 2011). Self-efficacy perception is related to the self-belief of the people for their abilities to establish control over the events affecting their functioning and lives (Bandura, 1994). Self-efficacy judgments are based on four fundamental sources of information including performance mastery experiences, vicarious experiences, verbal persuasion and physiological states (Bandura, 1982, 1989). Influencing self-efficacy judgment of an individual can bring success (Bandura, 1989). There are studies examined self-efficacy beliefs of teacher candidates and teachers in Turkey (Adilogullari and Senel, 2014; Senel, Adilogullari, and Ulucan, 2014). Correspondingly; academic self-efficacy perception must be related to the perceptions and beliefs of the students' abilities related to their academic lives.

The approaches to learning and studying that have the impacts on the students' academic belief systems or predicting these systems, directly and indirectly, play critical roles on the vocational development of the students receiving education in the institutions training teachers. Accordingly, these approaches can affect the students' abilities related to the teaching profession. From this point of view, it is essential to examine the predicting role of the approaches of teacher candidates on teacher efficacy beliefs. This study aims to determine study approaches of students taking pedagogical formation from different departments, examine academic and teacher self-efficacy beliefs, find out the role of these factors in academic achievement and compare students in physical education and sport and students in the different field. Based on the aim of this study, the following hypotheses were proposed

H1= Study approaches directly predict grade point average.

H2= Study approaches directly predict academic self-efficacy.

H3= Academic self-efficacy directly predicts teacher's efficacy.

H4= Study approaches indirectly predict teacher efficacy via GPA.

H5= Study approaches indirectly predict teacher efficacy via academic self-efficacy.

METHOD

Participants

The students consisting the sample group were recruited among the students based on the condition to carry on pedagogical formation courses in 2017-2018 educational season in Mugla.

Table 1. The demographical information and features of the participants

Variables		Frequency	Percent
Gender	Female	318	61.7%
	Male	197	38.3%
Department	History	88	17.1%
	Physical Education	104	20.2%
	Math	8	1.6%
	Graphic	7	1.4%
	Painting	9	1.7%
	Philosophy	5	1.0%
	Music	2	0.4%
	Business	14	2.7%
	Contemporary Turkish Dialects	45	8.7%
	Turkish Language and Literature	63	12.2%
	Food & Beverage	21	4.1%
	Biology	12	2.3%
	Nutrition	1	0.2%
	Aquaculture	2	0.4%
	Physics	4	0.8%
	Nursing	50	9.7%
	English Language and Literature	10	1.9%
	Hospitality Management	28	5.4%
	Sociology	42	8.2%
Academic Year	Sophomore	4	0.8%
	Third year	36	7.0%

	Final year	375	72.8%
	Graduate	100	19.4%
GPA	Between 0-2.00	20	3.9%
	Between 2.01-2.50	148	28.7%
	Between 2.51-3.00	189	36.7%
	Between 3.01-3.50	115	22.3%
	Between 3.51-4.00	43	8.3%
Total		**515**	**100**

$\bar{X}$(Age)=23.65, s.d.=3.21

Data Collection

Ethical Considerations: Participants were informed about the aim and content of the study. The participants were assured of their right to refuse to participate or to withdraw from the study at any time. The participants were assured that their information and scores in the scale would be kept secret. After accepting to complete the survey, the participnts were sent the document including the scales.

Academic Self-Efficacy: Academic Self-Efficacy Scale, developed by Jerusalem and Schwarzer (1981), translated to Turkish by Yılmaz, Gürçay, and Ekinci (2007), was used to measure the students' perception. The scale is one-dimensional and has seven items. Each item scaled between 1 (certainly does not fit) – 4 (entirely fit for me). The internal consistency coefficient and confirmatory factor analysis (CFA) results were shown in table 2. The fit indices of the Academic Self-Efficacy scale showed a good fit (Iacobucci, 2010; Hair, Black, Babin, Anderson & Tatham, 2010; Hu & Bentler, 1999; Jöreskog & Sörbom, 1986; Bentler, 1995; Steiger & Lind, 1980; Kline, 2016).

Table 2. The internal consistency coefficient and CFA results of the academic self-efficacy scale

							Cronbach's Alpha		
Academic Self-Efficacy							0.60		
CFA Fit Indices	**chi²**	**df**	**chi²/df**	**GFI**	**AGFI**	**TLI**	**CFI**	**SRMR**	**RMSEA**
	29.22	10	2.92	0.95	0.98	0.94	0.97	0.03	0.06

The Study Approaches: The study approaches of students were found out by using The Study Process Questionnaire, developed by Biggs, Kember, and Leung (2001), translated into Turkish by Yılmaz and Orhan (2011). The scale has two subscales including surface and deep approaches. The surface approach has two sub-dimensions including Surface Motivation and Surface Strategy. The deep approach also has two sub-dimensions including Deep Motivation and Deep Strategy. The scale had 20 items and scaled between 1(never or only rarely true of me) – 5 (always or almost always true of me). The internal consistency coefficients and confirmatory factor analysis (CFA) results were shown in table 3. The fit indices of The Study Process Questionnaire displayed a good fit (Iacobucci, 2010; Hair et al., 2010; Hu & Bentler, 1999; Jöreskog & Sörbom, 1986; Bentler, 1995; Steiger & Lind, 1980; Kline, 2016).

Table 3. The internal consistency coefficient and CFA results of the study process questionnaire

							Cronbach's Alpha		
Deep Approach							0.75		
Surface Approach							0.74		
CFA Fit Indices	**chi²**	**df**	**chi²/df**	**GFI**	**AGFI**	**TLI**	**CFI**	**SRMR**	**RMSEA**
	387.13	151	2.56	0.90	0.93	0.82	0.86	0.07	0.05

Perceived Teacher Efficacy: Perceived teacher efficacy of students was measured by using Ohio Teacher Efficacy Scale, developed by Tschannen-Moran and Woolfolk-Hoy (2001), adapted to Turkish by Baloğlu and Karadağ (2008). The Turkish form of the scale has five sub-scales including guidance, behavior management, motivation, teaching skill, assessment, and evaluation. The scale has 24 items scaled between 1 and 5. The internal consistency coefficients and confirmatory factor analysis (CFA) results were shown in table 4. The fit indices of Ohio Teacher Efficacy Scale displayed a good fit (Iacobucci, 2010; Hair et al., 2010; Hu & Bentler, 1999; Jöreskog & Sörbom, 1986; Bentler, 1995; Steiger & Lind, 1980; Kline, 2016).

Table 4. The internal consistency coefficient and CFA results of Ohio Teacher Efficacy Scale

						Cronbach's Alpha			
Guidance						0.78			
Behavior management						0.75			
Motivation						0.79			
Teaching skill						0.70			
Assessment and evaluation						0.47			
Total scale						0.93			
CFA Fit Indices	**chi²**	**df**	**chi²/df**	**GFI**	**AGFI**	**TLI**	**CFI**	**SRMR**	**RMSEA**
	554.85	240	2.31	0.89	0.91	0.92	0.93	0.04	0.05

Statistical analysis

The normality of the data was tested with Skewness and Kurtosis. Because the data showed normal distrubiton, parametric tests were used. The analyses for demographic information of the participants were done by using descriptive analysis. Independent *t*-test was used to analyze the differences between genders, departments. Participants reported their grade point average between 0-2.00, 2.01-2.50, 2.51-3.00, 3.01-3.50, and 3.51-4.00. Pearson Correlation test was used to analyze the relationship between GPA, the study approaches, academic self-efficacy and teacher efficacy. The hypothesized models were analyzed in AMOS by using path analysis.

RESULTS

Table 5. Gender differences regarding academic self-efficacy, study approaches, and teacher efficacy

Dimensions	**Subdimensions**	**Female (n=318)**		**Male (n=197)**				
		$\bar{X}$	S.D.	$\bar{X}$	S.D.	t	df	p
Study Approaches	Deep Motivation	3.18	0.68	3.08	0.75	1.658	513	0.098
	Deep Strategy	3.26	0.68	3.28	0.70	-0.317	513	0.752
	Surface Motivation	2.59	0.78	2.86	0.84	-3.707	513	**0.000****
	Surface Strategy	3.06	0.71	3.13	0.72	-1.084	513	0.279
	Deep Approach	3.22	0.61	3.18	0.65	0.754	513	0.451
	Surface Approach	2.82	0.65	2.99	0.69	-2.815	513	**0.005****
Self-Efficacy	Academic Self-Efficacy	2.95	0.49	3.04	0.48	-2.098	513	**0.036***
Teacher Efficacy Beliefs	Guidance	3.82	0.61	3.81	0.70	0.216	513	0.829
	Behavior Management	3.76	0.59	3.80	0.71	-0.568	513	0.570
	Motivation	3.91	0.62	3.88	0.69	0.589	513	0.556
	Teaching Skill	3.71	0.59	3.76	0.69	-0.740	513	0.460
	Assessment & Evaluation	3.70	0.74	3.73	0.79	-0.465	513	0.642

Gender differences regarding academic self-efficacy, study approaches, and teacher efficacy was shown in table 5. It was found that there were statistically significant differences between genders regarding surface approach ($p<0.01$, $t=-2.815$) and surface motivation ($p<0.001$, $t=-3.707$). Male students reported higher scores than females regarding surface approach and surface motivation. A significant difference was found between genders regarding academic self-efficacy in favor of males.

Table 6. Differences between students in physical education and sports (PES) department and those in other departments regarding academic self-efficacy, study approaches, and teacher efficacy

	PES (n=109)		**The others(n=406)**				
	$\bar{X}$	**S.D.**	**$\bar{X}$**	**S.D.**	**t**	**df**	**p**
Deep Motivation	3.12	0.64	3.15	0.72	0.398	513	0.712
Deep Strategy	3.29	0.59	3.26	0.71	-0.432	513	0.666
Surface Motivation	3.02	0.70	2.60	0.82	-4.875	513	**0.000****
Surface Strategy	3.26	0.61	3.04	0.73	-2.845	513	**0.005****
Deep Approach	3.21	0.54	3.20	0.65	-0.029	513	0.977
Surface Approach	3.14	0.54	2.82	0.69	-4.476	513	**0.000****

Academic Self-Efficacy	3.08	0.49	2.96	0.49	-2.159	513	**0.031***
Guidance	3.78	0.62	3.82	0.65	0.643	513	0.520
Behavior Management	3.77	0.66	3.78	0.64	0.183	513	0.855
Motivation	3.88	0.59	3.91	0.66	0.183	513	0.663
Teaching Skill	3.73	0.67	3.73	0.62	0.436	513	0.955
Assessment & Evaluation	3.64	0.82	3.73	0.74	1.027	513	0.305

The differences between students in physical education and sports department and those in the other departments regarding academic self-efficacy, study approaches, and teacher efficacy were displayed in table 6. Significant differences were found between students studying (or graduated from) in physical education and sports department and those in the other examined departments regarding surface motivation (t=-4.875, p<0.001), surface approach (t=-4.476, p<0.001) and academic self-efficacy (t=-2.159, p<0.05). The students in physical education and sports department reported higher scores than other students.

Table 7. Correlation coefficients, standard deviations, mean scores, and normal distribution values

	n = 515	**$\bar{X}$**	**S.D.**	**Skewness**	**Kurtosis**
1) GPA		3.02	1.00	0.218	-0.548
2) Deep Motivation		3.14	0.71	0.014	-0.016
3) Deep Strategy		3.26	0.69	-0.112	130
4) Surface Motivation		2.69	0.82	0.044	-0.412
5) Surface Strategy		3.08	0.72	-0.177	0.003
6) Deep Approach		3.20	0.63	-0.052	0.351
7) Surface Approach		2.89	0.67	-0.144	-0.118
8) Academic Self-Efficacy		2.99	0.49	-0.233	-0.237
9) Guidance		3.82	0.65	-0.360	0.054
10) Behavior Management		3.78	0.64	-0.211	-0.317
11) Motivation		3.90	0.65	-0.693	1.106
12) Teaching Skill		3.73	0.63	-0.197	-0.033
13) Assessment & Evaluation		3.71	0.76	-0.333	-0.112

	GPA	**DM**	**DS**	**SM**	**SS**	**DA**	**SA**	**ASE**	**GU**	**BM**	**MOT**	**TS**	**AE**
1) GPA	1												
2) DM	0.266**	1											
3) DS	0.211**	0.630**	1										
4) SM	-0.165**	-0.215**	-0.190**	1									
5) SS	-0.039	0.063	0.018	0.542**	1								
6) DA	0.265**	0.905**	0.900**	-0.225**	0.045	1							
7) SA	-0.121**	-0.097*	-0.106*	0.894**	0.860**	-0.112*	1						
8) ASE	0.204**	0.354**	0.299**	-0.045	0.075	0.362**	0.013	1					
9) GU	0.130**	0.277**	0.280**	-0.121**	0.133**	0.308**	-0.003	0.333**	1				
10) BM	0.104*	0.241**	0.248**	-0.091*	0.123**	0.270**	0.010	0.331**	0.808**	1			
11) MOT	0.136**	0.258**	0.249**	-0.105*	0.143**	0.281**	0.012	0.321**	0.816**	0.756**	1		
12) TS	0.082	0.265**	0.271**	-0.043	0.131**	0.297**	0.044	0.333**	0.783**	0.749**	0.709**	1	
13) AE	0.137**	0.238**	0.270**	-0.066	0.072	0.281**	-0.002	0.298**	0.653**	0.606**	0.620**	0.653**	1

*The GPA was codded between 1 (Between 0-2.00), 2 (Between 2.01-2.50), 3 (Between 2.51-3.00), 4 (Between 3.01-3.50), 5 (Between 3.51-4.00), *p<0.05, **p<0.01*

Table 7 displays the correlation coefficients, standard deviations, mean scores, and normal distribution values. GPA positively correlated with deep motivation (r=0.266, p<0.05), deep strategy (r=0.211, p<0.05), deep approach (r=0.265, p<0.05), academic self-efficacy (r=0.204, p<0.05), guidance (r=0.130, p<0.05), behavior management (r=0.104, p<0.05), motivation (r=0.136, p<0.05), assessment & evaluation (r=0.137, p<0.05); it negatively correlated with surface motivation (r=-0.165, p<0.05) and surface approach (r=-0.121, p<0.05). Deep approach positively correlated with academic self-efficacy (r=0.362, p<0.05), guidance (r=0.308, p<0.05), behavior management (r=0.270, p<0.05), motivation (r=0.281, p<0.05), teaching skill (r=0.297, p<0.05), assessment & evaluation (r=0.281, p<0.05). Academic self-efficacy positively correlated with guidance (=0.333, p<0.05), behavior management (r=0.331, p<0.05), motivation (r=0.321, p<0.05), teaching skill (r=0.333, p<0.05), assessment &

evaluation (r=0.298, p<0.05). The correlations between the variables were found to be low according to Taylor (1990).

Figure 1. Deep and surface study approaches as predictors of teacher efficacy and academic self-efficacy (Model 1)

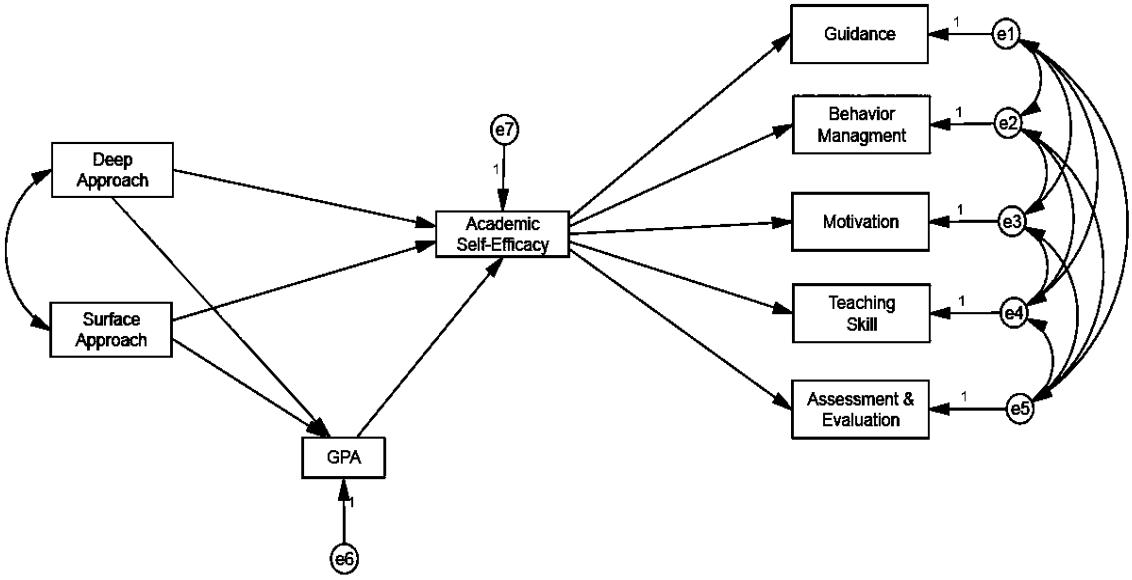
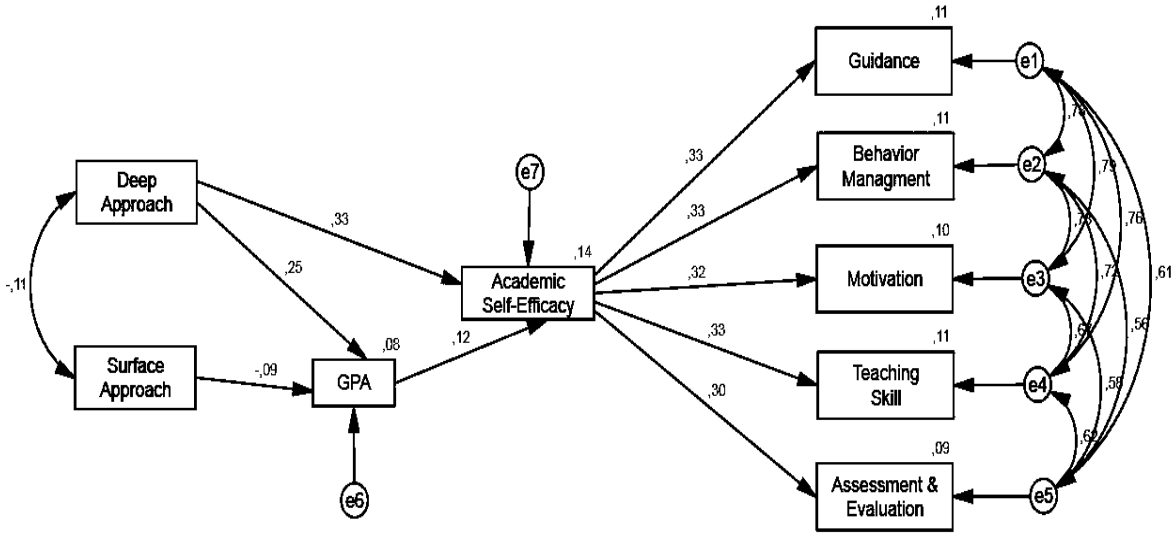


Figure 1 represents the model 1 hypothesizing that deep and surface approaches predict GPA and academic self-efficacy, directly and indirectly, academic self-efficacy via GPA. It is also hypothesized that GPA predicts academic self-efficacy directly and teacher efficacy indirectly via academic self-efficacy. The analysis revealed that the hypothesis that surface approach predicted academic self-efficacy directly was statistically insignificant. This path was removed from the model, and the analysis was calculated again for the new model (model 1.1).

Figure 2. Model 1.1



The regression directions and standardized regression coefficients were displayed in figure 2. Table 8 shows the fit indices and estimations for model 1.1. As it is seen in table 8, the fit indices show that the model has a good fit.

Table 8. The fit indices and estimations for model 1.1

	Mediator/ Modeator		Estimates	Standard Error	C.R.	p	Direct Effect	Indirect Effect
Surface Approach	→	GPA	-0.092	0.063	-2.163	p<0.05	-0.092	-
Deep Approach	→	GPA	0.254	0.067	5.967	p<0.001	0.254	-
Deep Approach	→	Academic Self-Efficacy	0.331	0.033	7.817	p<0.001	0.331	0.030
GPA	→	Academic Self-Efficacy	0.116	0.021	2.749	p<0.01	0.116	-
Academic Self-Efficacy	→	Guidance	0.333	0.055	8.010	p<0.001	0.333	-
Academic Self-Efficacy	→	Behavior Management	0.331	0.054	7.964	p<0.001	0.331	-
Academic Self-Efficacy	→	Motivation	0.321	0.055	7.679	p<0.001	0.321	-
Academic Self-Efficacy	→	Teaching Skill	0.333	0.053	8.013	p<0.001	0.333	-
Academic Self-Efficacy	→	Assessment & Evaluation	0.298	0.065	7.068	p<0.001	0.298	-
Deep Approach	ASE	Guidance	-	-	-	p<0.05	-	0.110
Deep Approach	ASE	Behavior Management	-	-	-	p<0.05	-	0.109
Deep Approach	ASE	Motivation	-	-	-	p<0.05	-	0.106
Deep Approach	ASE	Teaching Skill	-	-	-	p<0.05	-	0.110
Deep Approach	ASE	Assessment & Evaluation	-	-	-	p<0.05	-	0.098
Deep Approach	GPA+ASE	Guidance	-	-	-	p<0.05	-	0.009
Deep Approach	GPA+ASE	Behavior Management	-	-	-	p<0.05	-	0.009
Deep Approach	GPA+ASE	Motivation	-	-	-	p<0.05	-	0.009
Deep Approach	GPA+ASE	Teaching Skill	-	-	-	p<0.05	-	0.009
Deep Approach	GPA+ASE	Assessment & Evaluation	-	-	-	p<0.05		0.008
GPA	→	Guidance	-	-	-	p<0.05	-	0.035
GPA	→	Behavior Management	-	-	-	p<0.05	-	0.039
GPA	→	Motivation	-	-	-	p<0.05	-	0.037
GPA	→	Teaching Skill	-	-	-	p<0.05	-	0.039
GPA	→	Assessment & Evaluation	-	-	-	p<0.05	-	0.039
Surface Approach	→	Academic Self-Efficacy	-	-	-	p<0.05	-	-0.011
Surface Approach	GPA+ASE	Guidance	-	-	-	p<0.05	-	-0.003
Surface Approach	GPA+ASE	Behavior Management	-	-	-	p<0.05	-	-0.004
Surface Approach	GPA+ASE	Motivation	-	-	-	p<0.05	-	-0.003
Surface Approach	GPA+ASE	Teaching Skill	-	-	-	p<0.05	-	-0.004
Surface Approach	GPA+ASE	Assessment & Evaluation	-	-	-	p<0.05	-	-0.004

Fit Indices

Model 1.1	chi^2	df	chi^2/df	GFI	AGFI	TLI	CFI	SRMR	RMSEA
	39.76	16	2.48	0.95	0.98	0.97	0.98	0.06	0.05

While surface approach negatively predicted the GPA by approximately 9% (R^2=-0.092, p<0.05), deep approach positively predicted the GPA by approximately 25% (R^2=0.254, p<0.05). It was found that deep study approach directly predicted academic self-efficacy by about 33% (R^2=0.331, p<0.05), indirectly by almost 3% via the GPA. It was seen that the GPA positively predicted academic self-efficacy by about 12% (R^2=0.116, p<0.05). Academic self-efficacy positively and directly predicted guidance (R^2=0.333, p<0.05), behavior management (R^2=0.331, p<0.05), motivation (R^2=0.321, p<0.05), teaching skill (R^2=0.333, p<0.05), assessment and evaluation (R^2=0.298, p<0.05) by approximately 33%, 33%, 32%, 33%, and 33%, respectively.

Deep approach indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment and evaluation by about 11%, 10%, 10%, 11%, and %9 respectively, via academic self-efficacy. Deep approach indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 0.09%, 0.09%, 0.09%, 0.09%, and 0.08%, respectively, via GPA and academic self-efficacy. GPA indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 3%, 4%, 4%, 4%, and 4%, respectively, via academic self-efficacy. Surface approach negatively and indirectly predicted academic self-efficacy by about 1% via GPA. Surface approach negatively and indirectly predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 0.03%, 0.04%, 0.03%, 0.04%, and 0.04%, respectively, via academic self-efficacy and the GPA.

Figure 3. Deep study approach as the predictor of teaching efficacy and academic self-efficacy (Model 2)

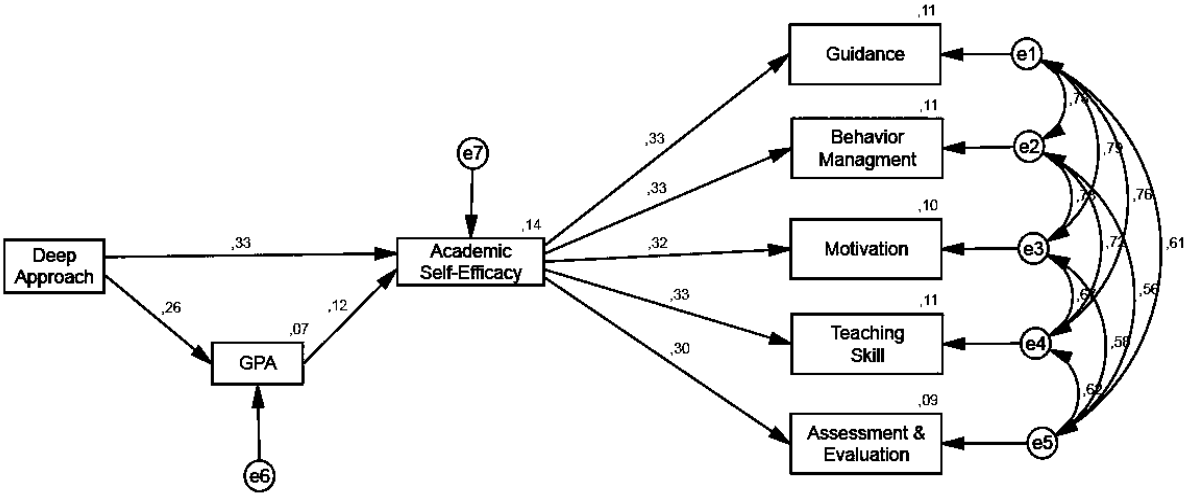


Figure 3 shows the model 2 hypothesizing deep approach predicted both academic self-efficacy and the GPA directly. It was hypothesized that deep approach indirectly predicted academic self-efficacy via GPA and teacher efficacy via GPA and academic self-efficacy. The fit indices and estimations for model 2 were shown in Table 9.

Table 9. The fit indices and estimations for model 2

	Mediator/ Moderator		Estimates	Standard Error	C.R.	p	Direct Effect	Indirect Effect
Deep Approach	→	GPA	0.265	0.067	6.220	p<0.001	0.265	-
Deep Approach	→	Academic Self-Efficacy	0.331	0.033	7.817	p<0.001	0.331	0.031
GPA	→	Academic Self-Efficacy	0.116	0.021	2.749	p<0.01	0.116	-
Academic Self-Efficacy	→	Guidance	0.333	0.055	8.010	p<0.001	0.333	-
Academic Self-Efficacy	→	Behavior Management	0.331	0.054	7.964	p<0.001	0.331	-
Academic Self-Efficacy	→	Motivation	0.321	0.055	7.679	p<0.001	0.321	-
Academic Self-Efficacy	→	Teaching Skill	0.333	0.053	8.013	p<0.001	0.333	-
Academic Self-Efficacy	→	Assessment & Evaluation	0.298	0.065	7.068	p<0.001	0.298	-
Deep Approach	ASE	Guidance	-	-	-	p<0.05	-	0.110
Deep Approach	ASE	Behavior Management	-	-	-	p<0.05	-	0.109
Deep Approach	ASE	Motivation	-	-	-	p<0.05	-	0.106
Deep Approach	ASE	Teaching Skill	-	-	-	p<0.05	-	0.110
Deep Approach	ASE	Assessment & Evaluation	-	-	-	p<0.05	-	0.098
Deep Approach	GPA+ASE	Guidance	-	-	-	p<0.05		0.010
Deep Approach	GPA+ASE	Behavior Management	-	-	-	p<0.05		0.010
Deep Approach	GPA+ASE	Motivation	-	-	-	p<0.05		0.009
Deep Approach	GPA+ASE	Teaching Skill	-	-	-	p<0.05		0.010
Deep Approach	GPA+ASE	Assessment & Evaluation	-	-	-	p<0.05		0.009
GPA	→	Guidance	-	-	-	p<0.05	-	0.035
GPA	→	Behavior Management	-	-	-	p<0.05	-	0.039
GPA	→	Motivation	-	-	-	p<0.05	-	0.037
GPA	→	Teaching Skill	-	-	-	p<0.05	-	0.039
GPA	→	Assessment & Evaluation	-	-	-	p<0.05	-	0.039

Fit Indices

Model 2	chi^2	df	chi^2/df	GFI	AGFI	TLI	CFI	SRMR	RMSEA
	33.88	10	3.38	.94	.98	.93	.98	0.06	0.03

Deep approach directly and positively predicted the GPA by approximately 26% (R^2=0.265, p<0.05). Deep approach predicted academic self-efficacy directly by about 33% (R^2=0.331, p<0.05) and indirectly by almost 3%. The GPA directly and positively predicted academic self-efficacy by about 12% (R^2=0.116, p<0.05). Academic self-efficacy positively and directly predicted guidance (R^2=.333,

p<0.05), behavior management (R^2=.331, p<0.05), motivation (R^2=.321, p<0.05), teaching skill (R^2=.333, p<0.05), assessment & evaluation (R^2=.298, p<0.05) by approximately 33%, 33%, 32%, 33%, 33%, respectively. Deep approach indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 10%, 10%, 10%, 11%, 9%, respectively, via academic self-efficacy. Deep approach indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about .09%, .09%, .09%, .09%, .08%, respectively, via GPA and academic self-efficacy. GPA indirectly and positively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 3%, 4%, 4%, 4%, 4%, respectively, via academic self-efficacy.

Figure 3. Surface study approach as the predictor of teaching efficacy and academic self-efficacy (Model 3)

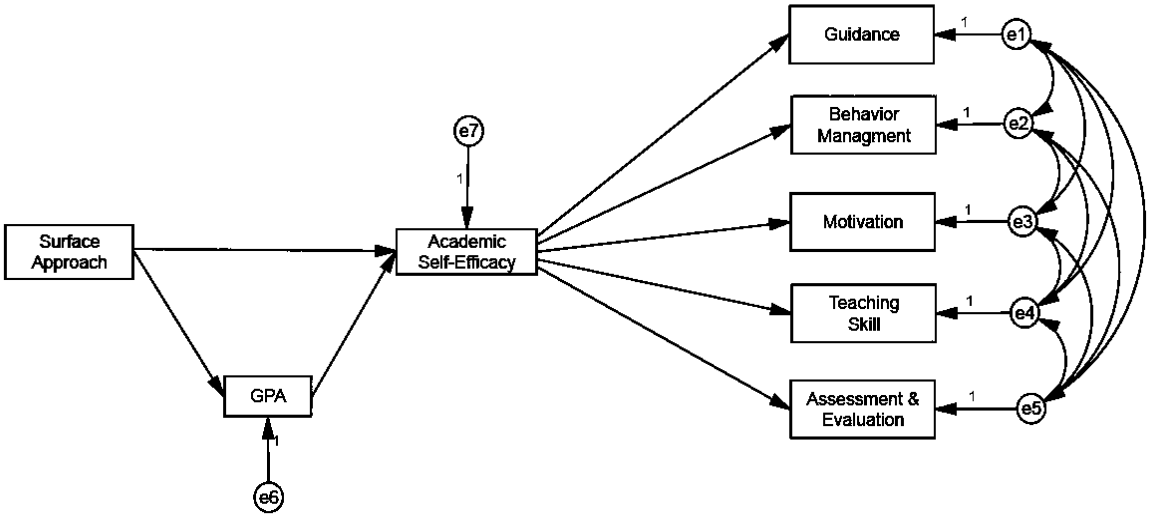
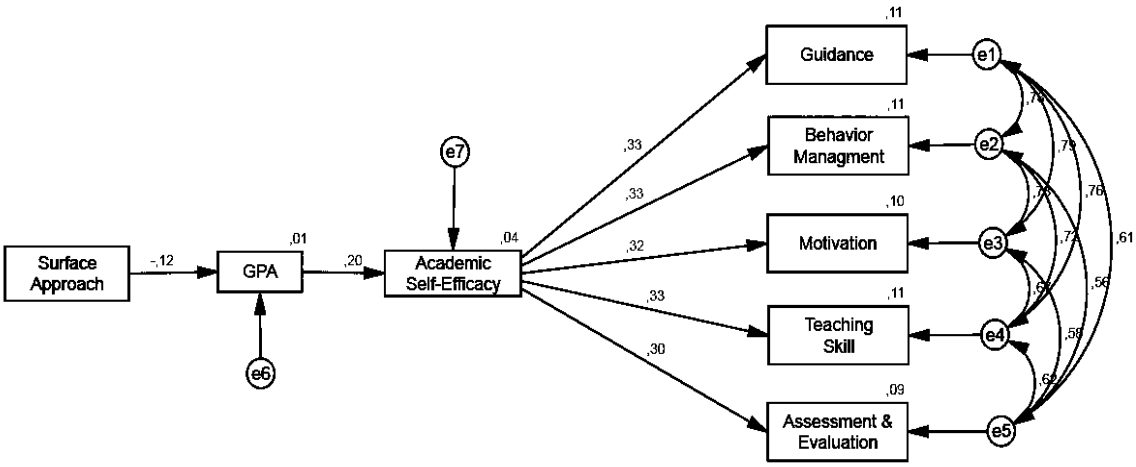


Figure 3 displays the model hypothesizing the surface approach as the predictor of teacher efficacy and academic self-efficacy (model 3). The analysis revealed that the hypothesis that surface approach predicted academic self-efficacy directly was statistically insignificant. This path was removed from the model, and the analysis was calculated again for the new model (Model 3.1).

Figure 4. Model 3.1



In model 3.1, it was hypothesized that surface approach predicted the GPA directly and academic self-efficacy indirectly via the GPA, and surface approach predicted teacher efficacy indirectly via GPA and academic self-efficacy. The fit indices and estimations for model 3.1 were given in Table 10.

Table 10. The fit indices and estimations for model 3.1

	Mediator/ Moderator		Estimates	Standard Error	C.R.	p	Direct Effect	Indirect Effect
Surface Approach	→	GPA	-0.121	0.065	-2.756	p<0.01	-0.121	-
GPA	→	Academic Self-Efficacy	0.204	0.021	4.723	p<0.001	0.204	-
Academic Self-Efficacy	→	Guidance	0.333	0.055	8.010	p<0.001	0.333	-
Academic Self-Efficacy	→	Behavior Management	0.331	0.054	7.964	p<0.001	0.331	-
Academic Self-Efficacy	→	Motivation	0.321	0.055	7.679	p<0.001	0.321	-
Academic Self-Efficacy	→	Teaching Skill	0.333	0.053	8.013	p<0.001	0.333	-
Academic Self-Efficacy	→	Assessment & Evaluation	0.298	0.065	7.068	p<0.001	0.298	-
Surface Approach	GPA	Academic Self-Efficacy	-	-	-	p<0.05	-	-0.025
Surface Approach	GPA	Guidance	-	-	-	p<0.05	-	-0.007
Surface Approach	GPA	Behavior Management	-	-	-	p<0.05	-	-0.008
Surface Approach	GPA	Motivation	-	-	-	p<0.05	-	-0.008
Surface Approach	GPA	Teaching Skill	-	-	-	p<0.05	-	-0.008
Surface Approach	GPA	Assessment & Evaluation	-	-	-	p<0.05	-	-0.008
GPA	→	Guidance	-	-	-	p<0.05	-	0.061
GPA	→	Behavior Management	-	-	-	p<0.05	-	0.068
GPA	→	Motivation	-	-	-	p<0.05	-	0.065
GPA	→	Teaching Skill	-	-	-	p<0.05	-	0.068
GPA	→	Assessment & Evaluation	-	-	-	p<0.05	-	0.068

Fit Indices

Model 1	chi^2	df	chi^2/df	GFI	AGFI	TLI	CFI	SRMR	RMSEA
	10.73	11	0.97	0.98	0.99	1.00	1.00	0.02	0.00

Surface approach directly and negatively predicted the GPA by approximately 12% (R^2=-0.121, p<0.05). The GPA directly predicted academic self-efficacy by about 20% (R^2=0.204, p<0.05). Academic self-efficacy directly and positively predicted guidance (R^2=.333, p<0.05), behavior management (R^2=0.331, p<0.05), motivation (R^2=0.321, p<0.05), teaching skill (R^2=.333, p<0.05), assessment & evaluation (R^2=.0298, p<0.05) by about 33%, 33%, 32%, 33%, 30%, respectively. Surface approach directly and negatively predicted academic self-efficacy by approximately 2% via the GPA. Surface approach indirectly and negatively predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 0.07%, 0.08%, 0.08%, 0.08%, and 0.08%, respectively, via the GPA and Academic Self-Efficacy. The GPA positively and indirectly predicted guidance, behavior management, motivation, teaching skill, and assessment & evaluation by about 6%, 7%, 6%, 7%, and 7%, respectively, via academic self-efficacy.

DISCUSSION

In this study, students' study approaches were examined as the predictors of academic self-efficacy and teacher efficacy. The roles of the GPA and academic self-efficacy were also examined. The estimates of model 1.1 showed that surface approach decreased the GPA while deep approach increased it. Deep study approach increased academic self-efficacy directly and indirectly via the GPA. Academic self-efficacy belief increased the teacher efficacy beliefs. Moreover, deep approach affected teacher efficacy via academic self-efficacy. Based on these results, it can be deduced that the teacher candidates adopting deep study approach will have higher GPA. Accordingly, their academic self-efficacy perceptions will increase, and these students will feel more efficient about being teachers.

The GPA increased teacher efficacy perception via the academic self-efficacy. It is possible to say that the students having higher in GPA will believe their abilities related to academic tasks and subjects. This belief will increase the perceived teacher efficacy. The results of the model 1.1 showed that the students adopting surface approach would have lower scores in the GPA, accordingly the perception that increases when having deep approach would decrease. The students having surface approach may feel that they are insufficient in academic subjects such as exams, homework, and projects. This perception may affect teacher efficacy negatively. Model 2 hypothesizing that deep study approach affected the GPA directly, predicted academic self-efficacy both directly and indirectly, affected teacher efficacy indirectly via academic self-efficacy revealed that these hypotheses were accepted. Schunk and Pajares (2002) stated that the peer group could affect academic self-efficacy. Pajares (1996) suggested

that self-efficacy had an important role in predicting academic self-efficacy beliefs. According to Zimmerman (2000), efficient students will have the high level of academic achievements.

When the estimates of model 1.1 and model 2 were compared, it was seen that the impact of deep approach on the GPA, academic self-efficacy and teacher efficacy remained almost the same. When model 1.1 and model 3.1 were compared, the estimates related to surface approach displayed changes. The regression coefficient between the GPA and the surface approach was -.092, this value was found to be -.12. While the negative indirect effect of surface approach on academic self-efficacy via the GPA was found to be -.011, this effect was -.025 in model 3.1. The regression coefficient between the GPA and academic self-efficacy was found to be .11 while this value was .20 in model 3.1. In model 3.1, the direct effect of a surface approach on the GPA and an indirect effect on academic self-efficacy increased when compared with those in model 1.1. This effect was negative in each model. The direct effect of the GPA on academic self-efficacy and indirect effect on teacher efficacy increased in model 3.1. Based on these comparisons, it can be said that deep study approach reduces the negative effects of surface approach on academic self-efficacy and the GPA. It can be deduced that the role of the GPA is essential in the self-efficacy belief (academic and teacher efficacy) level of a student who is more likely to adopt the surface approach. The increment of the effect of the GPA on academic self-efficacy and teacher efficacy in the situation in which surface approach exists and deep approach does not exist can be shown as the most fundamental reason for this deduction. The fit indices of the models showed that the models had a good fit (Iacobucci, 2010; Hair et al., 2010; Hu & Bentler, 1999; Jöreskog & Sörbom, 1986; Bentler, 1995; Steiger & Lind, 1980; Kline, 2016).

Kember et al. (1995) have found a positive correlation between GPA and surface approach while there are studies indicating the relationship between interinsic motivation and deep approach (Entwistle & Ramsden, 2015). It was suggested that the individuals, having higher scores in deep approach, perceived studying as personal development, saw learning as a target while surface approach was related to a perception of a way leading to achieve kind of quality rather than understanding the instructional subject (Cassidy & Eachus, 2000). Phan (2007) revealed that academic self-efficacy was a determinant of the academic performance. There are studies showing similar results in the literature (Pajares & Johnson, 1996; Pajares & Miller, 1994, 1995). Moreover, there are results indicating that self-efficacy has a mediator role between the relations of academic performance, surface and deep approaches (Pajares & Kranzler, 1995; Pajares, Miller, & Johnson, 1999; Pajares & Valiante, 1997; Phan, 2007).

In this study, statistically significant differences were found between genders regarding surface approach ($p<0.05$, $t=-2.815$) and surface motivation ($p<0.05$, $t=-3.707$). Male students reported higher scores than females in surface motivation and approach. While some studies reported gender differences regarding the approaches to learning and studying (Cano, 2005; Pajares & Johnson, 1996; Pajares & Miller, 1994; Smith & Miller, 2005; Biggs, 1987; Dart, Burnett, Purdie, Boulton-Lewis, Campbell & Smith, 2000; Senel, Yeniyol, Köle & Adiloğulları, 2014), some stated there was no gender difference (Phan, 2007).

CONCLUSION

The results showed that deep study approach improved academic self-efficacy and teacher efficacy, increased academic achievement. Conversely, surface approach affected academic achievement negatively and decreased academic self-efficacy and teacher efficacy. The implications to change the study approaches of teacher candidates for adopting a deep approach to study and learning will have positive impacts on their academic and vocational development. The approaches of the students can be affected by various factors like teaching environment (Lizzio, Wilson & Simons, 2002). Surface and deep approaches have impacts on habitual behaviors, understanding, reflection, and academic performance (Phan, 2007). Kaye and Brewer (2013) stated that the grad students having formal instructions related to teaching had higher levels of teacher efficacy. Tuchman and Isaacs (2011) found similar results. It can be concluded that study approaches affect a various academic system. Bandura (1986) asserts that self-efficacy has an effective role in the human agency. Instructional designers, developers, and educationist should consider the approaches of students, the role of self-efficacy in human development. This study provides the information to work on changing surface behaviors and approaches of the students to educate efficient students. This study also shows the importance of

academic-self-efficacy and GPA to educate efficient teachers. With this aspect, educators can consider the ways of changing study approaches of the students.

RECOMMENDATIONS

This study is limited to the theoretical framework. These models should be tested with educational implications. The students in teacher education departments can be included in future studies. Including pedagogical formation students at different universities can expand the sample group. This study was conducted with a quantitative approach. Mix model methods and experimental studies can be conducted in the future.

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