The Relationship between Attitudes towards Problem-based Learning and Motivated Strategies for Learning: A Study in School of Physical Education and Sport

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ABSTRACT The aim of this study was to examine the relationship between attitudes towards problem based learning (PBL) and motivated strategies for learning of students studying in school of physical education and sport. 333 of students in school of physical education and sport participated in this study. Turkish form of motivated strategies for learning questionnaire and the attitude scale towards Problem-based learning was used to collect data. Collected data was analyzed in SPSS 22.0. Two different models were hypothesized and models' fit indices were analyzed in AMOS. Two models were hypothesized in this study and both models were accepted. Consequently, these two examined factor can be effective in teaching and learning.

INTRODUCTION

Teaching is not only a simple set of learned skills, but also using teaching skills through a decision-making, problem-solving approach (Sage 2001). One of the most important purposes of education in Turkey is to educate sophisticated people having a personality developed in healthy and balanced way in terms of physical, mental, moral and emotional aspects (Basic Law of National Education 1973). Physical education provides proper environment to achieve this purpose. Tamer and Pulur (2001) defined physical education "the process to change person's behaviors relevant to aims of physical education (physical, mental, social and mental aims) by participating physical activities." Cheng (2011) suggested that effective and appropriate teaching strategies were required to develop students' learning abilities. Paris and Paris (2001) stated that learning strategies became important cognitive instrument for teachers to enhance, model and explain in their students throughout the curriculum. Self-regulated learning (SRL) seems to be appropriate and effective learning strategy to achieve the aims of national education in physical education, because it was stated in Cheng (2011) that learning to learn was an important factor and SRL had the agents of learning to learn such as organizing one's own learning, effective time management and information. The mode of volition supporting the task of maintaining one's actions in line with one's integrated self is called self-regulation (Kuhl and Fuhrmann 1998). Effective self-regulation is the bedrock of healthy psychological functioning (Hoyle 2010). According to Zimmerman (1990), students' SRL have three dimensions; use of SRL strategies, responsiveness to self-oriented feedback about learning effectiveness, and interdependent motivational processes. Self-regulated learners have the ability to choose, evaluate and regulate cognitive learning strategies (Wolters 2003). Zumbrunn et al. (2011) mentioned self-regulated processes such as goal setting, planning, self-motivation, attention control, flexible use of learning strategies, self-monitoring, appropriate help seeking, and self-evaluation. In the literature, there are studies examining SRL strategies such as goal setting (Schunk 1985; McCombs 1989; Schunk 1989a; Schunk 1991; Bandura 1994; Butler and Winne 1995), planning (McCombs 1989; Bauer and Baumeister 2011), monitoring and self-evaluation (Bandura 1986; McCombs 1989; Hoyle and Sowards 1993; Schraw and Moshman 1995; Labuhn and Zimmerman 2010), help seeking (Paris

and Byrnes 1989; Ryan et al. 2001), attention control (covert self-control) (Pressley et al. 1983; Corno 1989; Kuhl and Fuhrmann 1998; Fujita et al. 2006).

In addition to SRL strategies, physical education and sport teachers have different styles that can be used in teaching activities. Mosston and Ashworth (2008) suggested the styles of command, practice, reciprocal, self-check, inclusion, guided discovery, convergent discovery, divergent discovery, learner-designed individual program, learner-initiated, self-teaching styles. Convergent discovery style is more about problem solving in teaching physical education, because it was stated in Mosston and Ashworth (2008: 237) that one of the subject matter objectives is "to discover a single correct answer to a question or the single correct solution to a problem."

Tosun and Senocak (2013) suggested that students' attitudes were related to motivation and success. With this information, the importance of PBL becomes prominent. Fogarty (1997) defined PBL as a curriculum model designed around ill-structured, open-ended, or ambiguous real life problems. In another definition, Boud and Feletti (1997) suggested *"PBL is an approach to structuring the curriculum which involves confronting students with problems from practice which provide a stimulus for learning"* (p.15). Savery (2006) defined PBL *"as an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem."*

In their study in which students were asked to respond four questions about PBL, Morales-Mann and Kaitell (2001) found that clear benefits for the students from the use of the PBL format included increased autonomous learning, critical thinking, problem solving, and communication skills. Norman and Schmidt (1992) characterized the PBL by presenting a collection of carefully constructed problems to a small student group. The presented problems included observable events or phenomena that needed explanations. Colliver (2000) has stated that PBL was based on active learning, incorporates basic educational principles and involve theoretical learning mechanism. According to Barrett (2010), *"the PBL process includes being presented with a problem, PBL tutorials, independent study to work on learning issues, sharing and discussing what had been learned from independent study in tutorials together with preparing and giving presentations of their work on the problem."* Akinoglu and Ozkardes (2007) have said that in the classroom where problem-based learning is used, learners take much more responsibility for learning. Wood (2003) stated that students use triggers from problem case to define their own learning and they do independent, self-directed study before discussing what they learn. According to Utecht (2003), PBL helps students to apply the knowledge they have in a meaningful way to solve problems that can occur in real-life situations. Hmelo-Silver (2004) suggested that, in PBL, students worked collaboratively in a small group and learnt what they needed to know to solve the problem. PBL focuses on the whole problem (Fong et al. 2007), it is more than a simple teaching method (Vernon and Blake 1993), so it can be a narrow thinking if one says PBL is based on solving a problem that occur in any situation. Duch et al. (2001) suggested, *"In the problem-based approach, complex, real-world problems are used to motivate students to identify and research the concepts and principles they need to know to work through those problems."* Barret (2005) have suggested PBL is not only a teaching and learning technique, but also a total approach to education.

Teachers have important roles in the process of PBL as well as students. While students meet an ill-structured problem, teachers act as models and guide their students (Stepien and Gallagher 1993). The role of teacher in PBL is to facilitate the learning process such as internal communication and group work (Graaf and Kolmos 2003).

Because students are important elements of education, their attitudes towards the strategies which teacher choose for teaching can play a critical role in effective teaching and learning. In the light of this information, the importance of examining the relationship between attitudes towards PBL and learning strategies of students in physical education and sport department became prominent. It also seemed to be important to examine predictive strength of learning strategies and attitudes towards PBL on each other. The aim of this study was to examine the relationship between attitudes towards PBL and motivated strategies of students studying in school of physical education and sport for learning.

MATERIAL AND METHODS

Participants

333 of students in school of physical education and sport at Kayseri Erciyes University participated in this study. 42.9 percent of participants were female (n=143), 57.1 percent of them were male (n=190). The age mean of participants was found to be 21.68±1.75. Students were selected in departments of physical education and sport teacher (n=109), coaching education (n=112), sport management (n=83) and recreation (n=29).

Instruments

Motivated Strategies for Learning Questionnaire (MSLQ)

Turkish form of motivated strategies for learning scale (MSLQ) was used to determine the motivational learning strategies. Pintrinch and De Groot (1990) developed the scale and Üredi (2005) adapted to Turkish language. MSLQ has 44 items and participants were asked to respond to the item on 7-point Likert scale (1= *not at all true of me* to 7=*very true of me*). The instrument has two dimension including motivational beliefs and SRL strategies. Motivational beliefs has three sub-scales including self-efficacy (9 items), intrinsic value (9 items), and test anxiety (4 items). The dimension of SRL strategies has two sub-scales including cognitive strategy use (13 items) and self-regulation (9 items). Üredi and Erden (2009) used the same questionnaire to find out students' self-regulated learning strategies. In his own words, Pintrich (2004) suggested, "*The MSLQ has scales that reflect how students try*

to regulate their effort in the face of difficult, boring, or uninteresting tasks."

The Attitude Scale Towards Problem-based Learning

The attitude scale towards PBL, developed by Turan and Demirel (2009), was used to determine students' attitudes towards problem-based learning. The scale has 20 items including positive (10 items) and negative (10 items) attitude statements.

Statistical Analysis

Collected data was analyzed in SPSS 22.0. Two different models were hypothesized and the fit indices of both models were analyzed in AMOS. Independent t-test was used to determine differences between female and male students. One-way ANOVA test and Tukey test was used to determine differences between departments. Pearson Product Correlation was used to examine relationship between attitudes towards PBL and motivated strategies for learning.

RESULTS

The differences between genders in terms of positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation are displayed in Table 1. According to the analysis in the Table 1, statistically significant differences were found between female and male students in terms of test anxiety, cognitive strategy use and self-regulation (p<0.05). Female students showed higher scores than males in terms of these variables. Even if female students

Table 1: Differences between genders in terms of positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation

Variables	Female				Male			
	n	X	S.S.	n	X	S.S.	t	p
Positive attitude	143	3.77	0.73	190	3.74	0.63	.492	p> 0.05
Negative attitude	143	2.43	1.01	190	2.63	0.90	-1.876	p> 0.05
Intrinsic value	143	4.76	0.90	190	4.60	0.90	1.590	p> 0.05
Test anxiety	143	4.02	1.16	190	3.62	1.19	3.054	**p<0.01**[**]
Self-efficacy	143	4.80	0.96	190	4.60	0.98	1.859	p> 0.05
Cognitive strategy use	143	4.95	0.91	190	4.70	0.86	2.628	**p<0.01**[**]
Self-regulation	143	4.64	0.70	190	4.46	0.69	2.327	**p< 0.05**[*]

[**]Significance level is p<0.0, [*]Significance level is p<0.05

had higher scores in terms of positive attitude, intrinsic value and self-efficacy than males, except for negative attitudes, these results were not statistically significant (p>0.05).

Significant differences were found between departments in terms of positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation. Post Hoc analysis (Tukey test) was applied to determine which group engendered the differences.

The group means (SD) and post hoc comparison of departments in terms of variables are displayed in Table 2. In terms of positive attitude towards problem-based learning, significant difference was found between departments of PEST and CE. Students in PEST reported higher scores than those in CE (p<0.05). Significant difference was also found between departments of CE and SM. Students in SM department reported higher scores than those in CE (p<0.01).

In terms of negative attitude towards problem-based learning, significant difference was found between departments of PEST and CE. According to this analysis, students in CE reported higher scores than those in PEST (p<0.01). There was also significant difference found between departments of PEST and R. Students in R department reported higher scores than those in PEST (p<0.01).

Significant difference was found between departments of CE and SM in terms of intrinsic value. Students in CE department reported higher scores than those in SM (p<0.01). Significant differences were found between departments of PEST and CE, SM, R in terms of test anxiety. Students in PEST had lower scores than those in CE, SM, and R in terms of test anxiety (p<0.05). In self-efficacy sub-dimension, significant difference was found between departments of CE and SM. Students in SM had higher scores than those in CE (p<0.01).Significant difference was

Table 2: Group means (SD) and post hoc comparison of departments in terms of positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation

Variables	Group	Mean (SD)	^{a}p<0.05	^{b}Post hoc comparison	F
Positive Attitude	PEST	3.85 (.62)	.003**	PEST>CE	.011*
	CE	3.57 (.58)		SM>CE	.006**
	SM	3.89 (.76)			
	R	3.72 (.85)			
Negative Attitude	PEST	2.15 (.78)	.000**	CE>PEST	.000**
	CE	2.96 (.82)		R>PEST	.002**
	SM	2.40 (1.03)			
Intrinsic Value	R	2.82 (1.08)			
	PEST	4.65 (.84)	.018*	SM>CE	.009**
	CE	4.49 (.93)			
	SM	4.91 (.88)			
Test Anxiety	R	4.69 (.97)			
	PEST	3.38 (1.19)	.000**	CE>PEST	.011*
	CE	3.87 (1.11)		SM>PEST	.000**
	SM	4.10 (1.24)		R>PEST	.015*
Self-efficacy	R	4.12 (.99)			
	PEST	4.70 (.92)	.006**	SM>CE	.003**
	CE	4.46 (1.01)			
	SM	4.95 (.92)			
Cognitive Strategy Use	R	4.73 (1.01)			
	PEST	4.84 (.81)	.003**	SM>CE	.001**
	CE	4.58 (.95)			
	SM	5.06 (.86)			
Self-regulation	R	4.83 (.88)			
	PEST	4.50 (.71)	.001**	SM>CE	.000**
	CE	4.38 (.67)		SM>PEST	.017*
	SM	4.80 (.71)			
	R	4.53 (.54)			

**Significance level is p<0.0, *Significance level is p<0.05, a=ANOVA analysis, b=post hoc analysis
PEST= Physical Education and Sport Teacher, CE= Coaching Education, SM= Sport Management, R= Recreation

found between departments of CE and SM in terms of cognitive strategy use. Students in SM showed higher scores than those in CE (p<0.01). In terms of self-regulation, there was significant difference found between departments of PEST and SM. Students in PEST showed lower scores than those in SM (p<0.05). Significant difference was also found between departments of CE and SM. Students in SM showed higher scores than those in CE (p<0.01).

The correlations between positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation are displayed in Table 3. While positive correlations were found between positive attitude towards PBL and intrinsic value (r=.459, p<0.01), self-efficacy (r=390, p<0.01), cognitive strategy use (r=.397, p<0.01) and self-regulation (r=.334, p<0.01), negative correlations were found between negative attitudes towards PBL and positive attitudes towards problem-based learning(r=-.344, p<0.01), intrinsic value (r=-.255, p<0.01), self-efficacy (r=-.214, p<0.01), cognitive strategy use (r=-.303, p<0.01) and self-regulation (r=-.247, p<0.01). Positive correlations were found between test-anxiety and negative attitudes towards PBL (r=.194, p<0.01), cognitive strategy use (r=.141, p<0.01).

Positive correlations were found between intrinsic value and test anxiety (r=.161, p<0.01), self-efficacy (r=.793, p<0.01), cognitive strategy use (r=.743, p<0.01), self-regulation (r=.549, p<0.01). Positive correlations were found between self-efficacy and cognitive strategy use (r=.766, p<0.01), self-regulation (r=.606, p<0.01). Positive correlation was found between cognitive strategy use and self-regulation (r=.686, p<0.01).

It was hypothesized that attitudes towards PBL predicted motivated strategies for learning in Figure 1. In the model 1, regression weights (or regression coefficient) between positive attitude (PA) and intrinsic value (IV), test anxiety (TA), self-efficacy (SE), cognitive strategy use (CSU), and self-regulation (SR) were found to be .42, .08, .36, .33, .28, respectively. Regression weights between negative attitude (NA) and IV, TA, SE, CSU, SR were found to be -.11, .22, -.09, -.19, -.15, respectively.

The fit indices of hypothesized model 1 were displayed. Before modification, the fit indices were low to accept the model in Table 4. The indices before modification showed that error pairs should be modified. The pairs with high error covariance were $\varepsilon1, \varepsilon2, \varepsilon3, \varepsilon4, \varepsilon3, \varepsilon5, \varepsilon3, \varepsilon6, \varepsilon3, \varepsilon7, \varepsilon4, \varepsilon5, \varepsilon4, \varepsilon6, \varepsilon4, \varepsilon7, \varepsilon5, \varepsilon6, \varepsilon5, \varepsilon7,$ and $\varepsilon6, \varepsilon7$. Afterwards related error pairs were connected in the model and estimates were calculated again. Model fit indices showed that model was at acceptable fit level.

It was hypothesized that motivated strategies for learning predicted attitudes towards problem-based learning in figure 2. In the model 2, regression weights between IV, TA, SE, CSU, SR and PA were found to be .37, -.09 -.01, .09, .07, respectively. Regression weights between IV, TA, SE, CSU, SR and NA were found to be -.17, .25, .15, -.31, -.02, respectively.

The fit indices of hypothesized model 2 are displayed in Table 5. Before modification, the fit indices were seen to be low to accept the model. The indices before modification showed that error pairs should be modified. The pairs with high error covariance were $\varepsilon1, \varepsilon2, \varepsilon3, \varepsilon5, \varepsilon3, \varepsilon7, \varepsilon3, \varepsilon8, \varepsilon3, \varepsilon9, \varepsilon5, \varepsilon7, \varepsilon5, \varepsilon8, \varepsilon7, \varepsilon8, \varepsilon7, \varepsilon9,$ and $\varepsilon8, \varepsilon9$. After-

Table 3: Correlations between positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation

	1) Positive Attitude	2) Negative Attitude	3) Intrinsic Value	4) Test Anxiety	5) Self-Efficacy	6) Cognitive StrategyUse	7) Self-Regulation
	3.75 (0.68)	2.54 (.95)	4.66 (0.90)	3.79 (1.19)	4.68 (0.97)	4.81 (0.89)	4.54 (0.70)
1	1						
2	-.344**	1					
3	.459**	-.255**	1				
4	.008	.194**	.161**	1			
5	.390**	-.214**	.793**	.086	1		
6	.397**	-.303**	.743**	141**	.766**	1	
7	.334**	-.247**	.549**	-.043	.606**	.686**	1

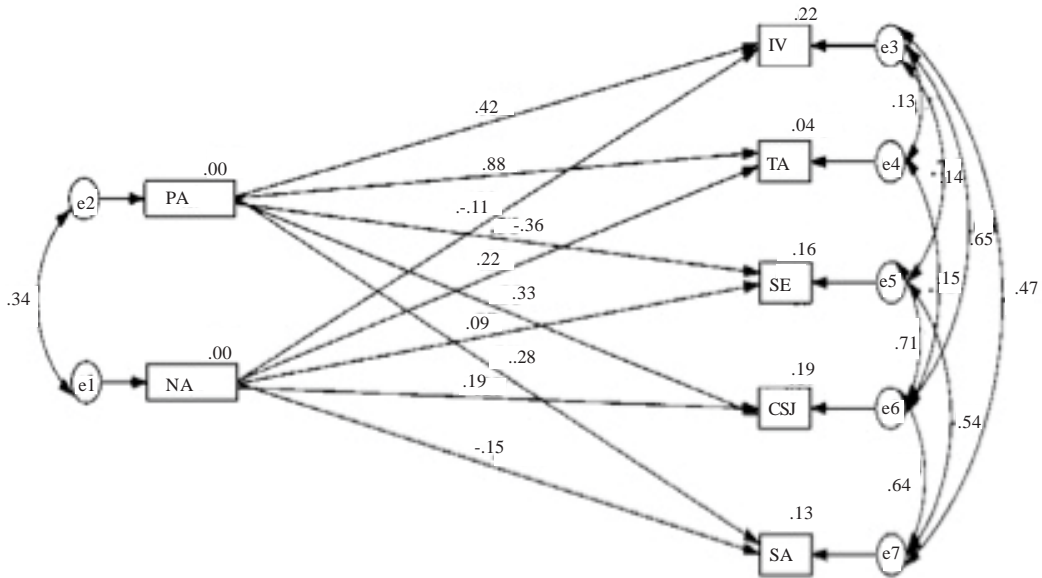**. Correlation is significant at the 0.01 level (2-tailed). n=333, mean(standard deviation)

Fig. 1. Attitudes towards problem-based learning as predictors of motivated strategies for learning (Hypothesized model 1)
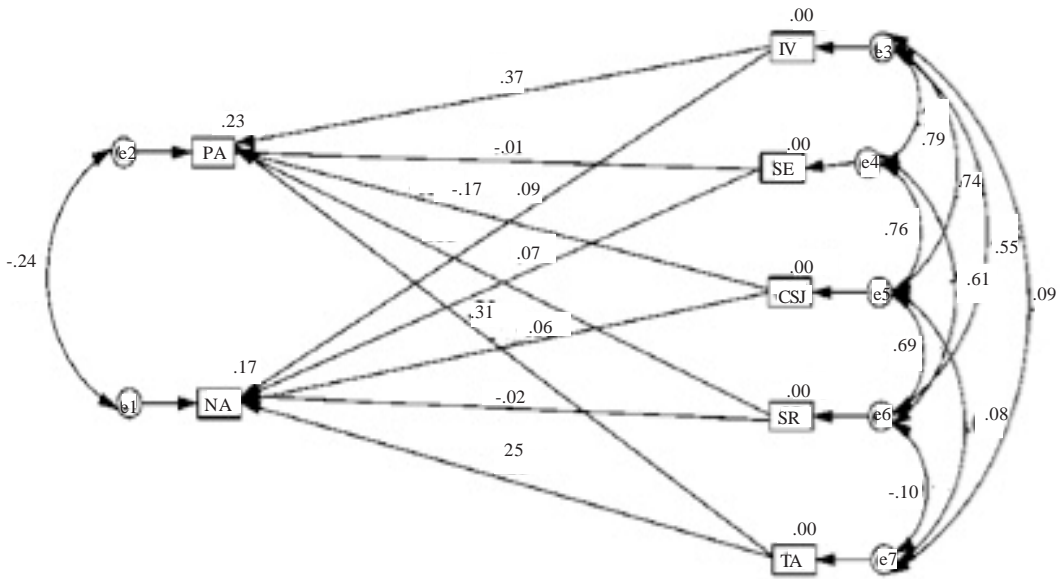

Fig. 2. Motivated strategies for learning as predictors of attitudes towards problem-based learning (Hypothesized model 2)

Table 4: Fit indices of hypothesized model 1

Model	χ^2	df	χ^2/df	AGFI	GFI	NFI	TLI	CFI	RMSEA
Before modification	800.8	11	72.72	-.100	.568	.254	-.433	.249	.465
After modification	7.2	2	3.6	.914	.994	.993	.948	.995	.08

Table 5: Fit indices of hypothesized model 2

Model	χ^2	df	χ^2/df	AGFI	GFI	NFI	TLI	CFI	RMSEA
Before modification	930.1	11	84.55	.179	.537	.133	-.668	.126	.502
After modification	2.5	1	2.5	.941	.998	.998	.971	.999	0.06

wards related error pairs were connected in the model, and estimates were calculated again. Model fit indices showed that model was at acceptable fit level, because RMSEA was found to be .06.

DISCUSSION

The aim of this study was to examine the relationship between attitudes towards PBL and motivated strategies for learning of students studying in school of physical education and sport. Statistically significant differences were found between female and male students in terms of test anxiety, cognitive strategy use and self-regulation. Female students reported higher scores than males in terms of these variables in Table 1. It can be said that female students feel more anxious than males when they are having exams. It can also be referred that female students use cognitive strategies more effectively than males in learning activities. Also, it can be stated that female students in school of physical education and sport use self-regulatory strategies in their learning activities better than males. Yüksel (2013) found significant differences between female and male teacher candidates in terms of self-regulation skill levels. Significant differences were found between departments in terms of positive and negative attitudes towards problem based learning, intrinsic value, test anxiety, self-efficacy, cognitive strategy use and self-regulation in Table 2.

While positive correlations were found between positive attitude towards PBL and intrinsic value (r=.459, p<0.01), self-efficacy (r=390, p<0.01), cognitive strategy use (r=.397, p<0.01) and self-regulation (r=.334, p<0.01), negative correlations were found between negative atti-

tudes towards PBL and positive attitudes towards problem-based learning (r=-.344, p<0.01), intrinsic value (r=-.255, p<0.01), self-efficacy (r=-.214, p<0.01), cognitive strategy use (r=-.303, p<0.01) and self-regulation (r=-.247, p<0.01). Positive correlations were found between test-anxiety and negative attitudes towards PBL (r=.194, p<0.01), cognitive strategy use (r=.141, p<0.01).

Positive correlations were found between intrinsic value and test anxiety (r=.161, p<0.01), self-efficacy (r=.793, p<0.01), cognitive strategy use (r=.743, p<0.01), self-regulation (r=.549, p<0.01). Positive correlations were found between self-efficacy and cognitive strategy use (r=.766, p<0.01), self-regulation (r=.606, p<0.01). Positive correlation was found between cognitive strategy use and self-regulation (r=.686, p<0.01). Pintrich (1999) found positive relationship between self-efficacy and self-regulation, task value and cognitive strategy, goal-orientation and self-regulation. Yüksel (2013) found positive correlation between success and self-regulation. Kahyaoglu (2013) found no significant difference between genders in terms of attitudes towards PBL. Alper (2008) found that female and male students had positive attitude towards PBL. Akinoglu and Ozkardes (2007) found that problem-based active learning model plays a role to increase academic achievement. Norman and Schmidt (1992) suggested that students' intrinsic interest in subject matter could be enhanced by PBL. In their study, So, Yeung et al. (2001) observed that students were active in searching for information from a variety of source to solve problems identified by the researchers. Nango and Tanaka (2010) suggested that a PBL program with multidisciplinary healthcare students significantly affected the clinical decision making by medical students. Tosun and Senocak (2013) have sug-

gested, *"The probability of having willingness about learning task is higher in students with a positive attitude."*

In Figure 1, it was hypothesized that attitudes towards PBL predicted motivated strategies for learning, and model fit indices showed that the model 1 was at acceptable level. In Figure 2, it was hypothesized that motivated strategies for learning predicted attitudes towards problem-based learning, and model fit indices showed that the model 2 was at acceptable level. Üredi and Üredi (2005) found that cognitive strategy use, self-regulation, self-efficacy and intrinsic value predicted math success. Mousoulides and Philippou (2005) found that self-efficacy was strong predictor of academic performance in mathematics.

In the literature, it has been found that self-regulated learners are more successful than others (Cabi 2009; Sagirli et al. 2010; Cabi and Gulbahar 2008; Beisthuizen 2008; Kurman 2004; Gravill and Compeau 2008; Zimmerman 2008).

Self-regulation does not automatically develop as people become older, nor is it passively acquired from the environment. The sub-processes of SRL are altered during development, and interventions differ in their effects on the acquisition of self-regulatory skills (Shunk 1989b). Teachers who consider their students' self-efficacy beliefs, goal setting, strategy use, and other forms of self-regulation in their instructional plans not only enhance students' academic knowledge, but also they increase their students' capability for self-directed learning throughout their life span (Zimmerman and Schunk 2002). Good teachers are encouraged to reinforce adaptive behaviors in students, but they are also encouraged to promote student cognitions that motivate student self-regulation (for example encourage students to believe they can achieve through their own efforts) (Pressley and Roehrig 2002). A SRL perspective shifts the focus of educational analyses from student learning abilities and environments at school or home as fixed entities to students' personally initiated strategies designed to improve learning outcomes and environments (Zimmerman 1989). Recognizing individual differences in characteristics of children may be beneficial for SRL or detrimental to it (Blair et al. 2010). SRL provides students opportunity to be independent of their teachers in extending and updating their knowledge base (Boakaerts 1996).

In physical education and sport classes, students take courses in different contexts. As suggested in Wolters and Pintrich (1998) and Pintrich (1999), motivational aspects of SRL are context specific. This finding shows the importance of context in teaching physical education. As a support to this idea, Zimmerman (1989) hypothesized the reciprocal interaction of person (self), environment, which we suggested that it can be important in physical education, and behavior. In this social cognitive view, these three factors effect each other. In this study, it has been found that learning strategies and PBL have predictive strength on each other. Utecht (2003) has concluded that PBL in student-centered classroom maximizes the students' involvement in learning process. In the study by Shumow (2001), it was stated that some evidence showed that PBL was effective to educate future teachers to apply the content from educational psychology to problematic situations.

CONCLUSION

The aim of this study was to examine the relationship between attitudes towards problem based learning (PBL) and motivated strategies for learning of students studying in school of physical education and sport. The results in this study showed that both SRL and PBL are important strategies in learning. This study can contribute the literature in the field of physical education and sport. Consequently, it can be said that these two examined factors can be effective in teaching and learning in physical education and sport.

RECOMMENDATIONS

This study was conducted with 333 students in school of physical education and sport. Students from different fields can be included in future studies. Classroom-based studies can be conducted to confirm the importance of SRL and PBL for education in physical education and sport sciences.

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