Conference Paper

Achievement Emotion during Class and Its Impact on the Use of Learning Strategies

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Abstract

The purpose of present study was to investigate the impact of achievement emotions during Statistics Class on the use of learning strategies. This study involved 339 of undergraduate students of Faculty of Education, Universitas Negeri Semarang, who take the statistics class. The hierarchical regression analysis showed that students' enjoyment positively predicted the use of rehearsal, elaboration, and organization learning strategies. In contrast, not all negative emotions have correlation with the use of learning strategies. Boredom positively predicted the use of rehearsal, but negatively predicted the use of elaboration. Then, angry negatively predicted the use of rehearsal. Findings of present study asserted the importance of enjoyment during class to encourage students use the appropriate and adaptive learning strategies.

Keywords: achievement emotions; learning strategies

1. Introduction

Academic achievement is the main criterium in evaluating students success in learning which is the most investigated (for example, Lee & Stankov, 2018; Meens, Bakx, Klimstra, & Denissen, 2018). Student who success in achieving a certain level of competences indicates that he is successful in processing the learning information. Various studies have shown that the use of learning strategies is the most important predictor for academic achievement both in face-to-face learning (Lim, Lau, Nie, 2008; Zimmerman & Martinez-Pons, 1990) and online learning (Lin, Zhang, & Zheng, 2017). In the context of mathematics learning, a survey from various countries showed a tendency that students who have high achievements in mathematics subjects matter tend to use varied learning strategies (Thiessen & Blasius, 2008). However, the contribution of learning strategies to learning achievement is weaker in online learning compared to face-to-face learning (Broadbent & Poon, 2015). Therefore, this study is intended to explore the use of learning strategies in statistical classes on undergraduate students.

Learning strategies are generally divided into two categories, namely surface learning strategies and deep learning strategies. In research findings, surface learning strategies

are negatively associated with academic achievement, while deep learning strategies are positively associated with learning achievement (Liem, Lau, Nie, 2008). Surface learning strategies are often associated with rehearsal strategy, while deep learning is associated with elaboration and organization strategies (Duncan & McKeachie, 2005). The rehearsal strategy is implemented by repeatedly learning and memorizing information from a lesson in order to be remembered. Elaboration is a strategy to increase understanding of lesson information by restating the learning information in student own language which is usually implemented using technique of paraphrasing and summarizing. Organization is a learning strategy which is directed at increasing understanding by making meaningful patterns of learning information that is conducted by outlining and creating tables.

In the perspective of the control-value theory of achievement emotions (Pekrun, 2006), the use of learning strategies is predicted by students' achievement emotions. However, the impact of many type of emotions on the use of learning strategies still needs to get further clarification. Research from Rosa and Bernardo (2013) showed that the more positive the emotions will tend to increase the possibility of using deep learning strategies. However, the findings of this study do not specifically describe the types of deep learning strategies that tend to be used from increasing positive emotions. In addition, Wittmann's research (2011) showed that positive emotions positively predicted deep learning strategies, while negative emotions predict negatively the use of surface learning strategies (organization, making connections, critical testing and metacognition). Again, the study conducted by Wittmann (2011) does not explain the effects of positive or negative emotions on surface learning strategies.

Therefore, in order to clarify the effects of positive emotions and negative emotions on the use of surface learning strategies and deep learning strategies, this study was intended to identify the contributions of positive emotions and negative emotions during statistics classes (particularly, anger, boredom, and enxiety) on surface learning strategies (rehearsal) and deep learning strategies (elaboration and organization). In this study, it can be predicted that pleasure will positively predict the use of rehearsal, elaboration, and organization (H1), while anger, boredom, and anxiety will predict negatively the use of rehabilitation, elaboration, and organization (H2).

2. Methods

2.1. Participants

Present study involved three hundred and thirty-nine undergraduate students (73,5% were female) from various department of Universitas Negeri Semarang, Indonesia. All participants adalah peserta mata kuliah statistics. Their ages ranged from 17 to 24 years old (M = 19.15, SD = 4,28). Before responding the questionnaire, participants were required to express a written consent for participating to the study.

2.2. Instruments

There are two instruments applied in present study, namely, achievement emotion questionnaire and learning strategies scales. The achievement emotions questionnaire was applied to assess participants' emotions during participate in statistics class. The learning strategies scale was implemented to assess students' learning strategies. The achievement emotions questionnaire and learning strategies scales were administered in Indonesian language. The back-translation procedure was implemented to translate the scales from English version into Indonesian language version with involving 2 interpreter of Bahasa-English.

2.3. Achievement emotions during Statistics Class

Emotions during participate in statistics class were assessed using the achievement emotions questionnaire (AEQ; Pekrun, Goetz, Titz, & Perry, 2002). A total 25 items were applied to assess enjoyment (4 items; *"I enjoy being in Statistics Class"*), boredom (11 items; *"I get bored"*), angry (5 items; *"I feel frustrated in Statistics Class"*) and anxiety (5 items; *"I feel nervous in Statistics Class"*) during class. Participants responded each item on 4-point scale ranging from none of the time (0) to all of the time (7). The coefficient alpha of the Achievement Emotions Scale in the present study ranged from.83 to.93 (see Table 1).

2.4. Learning strategies

Students' use of learning strategies during learning statistics were assessed using Learning Strategies Scale from Motivation Strategies and Learning Questionnaire (MSLQ; Pintrich, P. R., Smith, D. A. F., García, T., & McKeachie, W. J., 1991). A total of 14 items were applied to assess rehearsal learning strategy (4 items; *"When I study for*

Statistics class, I practice saying the material to myself over and over"), elaboration learning strategy (6 items; *"When I study for Statistics class, I pull together information from different sources, such as lectures, readings, and discussions"*), and organization learning strategy (4 items; *"When I study the readings for Statistics course, I outline the material to help me organize my thoughts"*). All participant responded each item on 4-point scale ranging from none of the time (0) to all of the time (7). The coefficient alpha of the Learning Strategies Scale in the present study ranged from.81 to.92 (see Table 1).

3. Procedures

This study was applied a correlational design (Cresswell, 2011) to investigate the contribution of achievement emotions during learning in Statistics class on the use of learning strategies. Before the statistics class was begun, all student was informed that they would be required to respond two scales based on their experience during statistics class at that time. Therefore, all students informed to participate statistics class as usual. Ten minutes before class was ended, students were asked to spontaneously respond two scales in accordance with their experience in the class.

4. Results

4.1. Descriptive data

Findings of present study indicated that undergraduate students tend to bore during joining Statistics class. Moreover, they frequently applied elaboration learning study during learning statistics course. The intercorrelation matrices showed that not all type of achievement emotions had correlation with the use of learning strategy, only enjoyment perform a consistent correlation with all type of learning strategies. Boredom had a positive correlation with rehearsal, whereas boredom had a negative correlation with elaboration. All kind of achievement emotions did not have correlation with organization. Enjoyment had a negative correlation with all type of negative emotions, then angry, boredom, and anxiety had positive correlation with each other. All type of learning strategies had positive correlation with each other.

TABLE 1: The inter-correlation matrices, mean, standard deviation and reliability. (* $p <.05$ ** $p <.01$).

	1	2	3	4	5	6	7	8	9	10
1. Gender										
2. Semester	.35*									
3. Age	.60*	.47*								
4. Enjoyment	.02	-.01	.07							
5. Boredom	.11**	.03	.15*	-.48*						
6. Angry	.13*	-.02	.16*	-.15*	.61*					
7. Anxiety	.18*	.12*	.19*	-.09**	.46*	.59*				
8. Rehearsal	.03	-.04	-.06	.21*	.09**	-.10**	-.09			
9. Elaboration	.04	.08	.02	.28*	.03	.02	.02	.49*		
10. Organization	.01	-.07	-.03	.27*	.01	.07	.04	.46*	.62*	
M	-	2.88	19.15	2.30	5.36	2.21	2.39	2.30	3.48	2.38
SD	-	1.86	4.28	0.59	1.99	0.89	0.95	0.70	0.79	0.63
α	-	-	-	.86	.93	.83	.83	.81	.81	.82

4.2. The impact of achievement emotions on learning strategies

The results of hierarchical regression analysis showed that achievement emotions predicted the use of learning strategies during studying Statistics. As predicted, enjoyment, as a positive emotion, positively predicted the use of rehearsal ($\beta =.17$, $p <.01$), elaboration ($\beta =.36$, $p <.01$), and organization strategies ($\beta =.34$, $p <.01$). These results fully supported the hypothesis 1.

Several negative emotions predicted the use of learning strategies. Boredom cenderung mendorong siswa menggunakan surface learning strategy, namely rehearsal ($\beta =.16$, $p <.01$), tetapi enggan menggunakan deep learning strategy, particularly elaboration ($\beta =.20$, $p <.05$). Angry negatively predicted the use of rehearsal strategy ($\beta =.18$, $p <.05$). These results particularly supported hypothesis 2.

TABLE 2: Hierarchical regression analysis results. * $p <.05$ ** $p <.01$.

Predictors	Rehearsal				Elaboration				Organization			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	β	t	β	t	β	t	β	t	β	t	β	t
Gender	.01	0.12	.027	0.41	.04	0.61	.06	0.85	.05	0.78	.07	1.11
Semester	-.01	-0.13	-.01	-0.19	.09	1.38	.10	1.67	-.07	-1.14	-.07	-1.19
Age	-.06	-0.88	-.07	-0.97	-.05	-0.62	-.07	-1.05	-.03	-0.40	-.04	-0.59
Enjoyment			.17	2.78*			.36	5.95*			.34	5.49*
Boredom			.16	2.00*			-.20	-2.57**			-.12	-1.60
Angry			-.18	-2.41**			.08	1.00			-.07	-0.89
Anxiety			-.06	-0.88			.03	0.39			.03	0.50
ΔR			.22				.23				.24	
ΔR²			.08				.10				.09	
ΔF			6.75*				8.94*				8.55*	
R	.06		.28		.09		.32		.08		.32	
R²	.00		.08		.01		.10		.01		.10	
F	0.45		4.06*		0.87		5.51*		0.69		5.21*	

5. Discussion

Present study was intended to clarify the impact of achievement emotions on the use or learning strategies. Findings of present study indicated that enjoyment predicted the use of all learning strategies, whereas negative emotions predicted part of learning strategies. Boredom only positively predicted the use of rehearsal strategy, but negatively predicted the use of elaboration. Moreover, angry decreasing possibility student uses rehearsal. The results of present study is supported the study from Rosa and Bernardo (2013) and Wittmann (2011). However, findings of present study succeed to clarify the kind of achievement emotions which predict the use or learning strategies.

Interestingly, findings of present study showed that boredom increasingly the possibility to applied rehearsal strategy, but decreasingly the use of elaboration strategy. Those findings can be interpreted that boredom encourage students to implemented surface learning strategies. Present study informed the importance to reduce boredom and increase the enjoyment.

Anger in present study was identified to decrease students willingness to apply rehearsal learning strategy. This finding can be interpreted that when student get angry during learning, they unable to use cognitive resource to concentrate toward learning information. During anger period, student tend pay attention on the source or the cause of their anger (), consequently learning information are ignored. Therefore, emotion of angry decreasing students' performance in memorizing.

There are several implications from these findings. First, teacher need to stimulate students develop enjoyment and interest toward learning course. Secondly, facilitating students implemented various learning strategies can be conducted after students develop enjoyment on learning. Finally, teacher need to build and maintain students' enjoyment during learning to make student stay focus on the classroom learning.

6. Conclusions

This study clarifies the impact of achievement emotions on the use of learning strategies. Enjoyment as a positive emotion predict the use of rehearsal, elaboration, and organization, whereas negative emotions (boredom and angry) had correlation with rehearsal and elaboration strategies.

References

[1] Lee, J. & Stankov, L. (2018). Non-cognitive predictors of academic achievement: Evidence from TIMSS and PISA. *Learning and Individual Differences*. 65, 50-64. DOI: 10.1016/j.lindif.2018.05.009.

[2] Pintrich, P. R., Smith, D. A. F., García, T., & McKeachie, W. J. (1991*). A manual for the use of theMotivated Strategies for LearningQuestionnaire (MSLQ).* Ann Arbor: University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning.