

Self-Regulated Learning and Cognitive Learning Style among Psychology Students

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Abstract

The literature review indicated that learning style has an important role in self-regulated learning process, so the purpose of this study was to examine relationship between cognitive learning style, a kind of learning style, and self-regulated learning strategies _resource management, help seeking, peer learning, effort regulation and metacognitive strategies. Participants were 170 undergraduate students (19-25 years old) who were registered in psychology courses in 2013 at Islamic Azad university Azadshahr branch. Measurement tools were the Group Embedded Figures Test (Witkin, Oltman, Raskin, & Karp, 1971) and Motivated Self-Regulated Learning Strategies Questionnaire (Pintrich, Smith, Garcia, &McKeachie,1991). Result showed distribution of all variables tends to normal distribution. Students' scores in all variables were about middle except resource management and help seeking. Path analysis with Amos 21 showed that cognitive learning style scores significantly affect only the students' help seeking strategy scores (path coefficient = -0/262), and the goodness of fit of model was adequate(CMIN=29/9, CMIN/DF=2/9, RMSEA=0/055. GFI=0/89 and AGFI=0/87).

KEYWORDS: cognitive learning style, self-regulated learning strategies, resource management, help seeking, peer learning, effort regulation and metacognitive strategies, path analysis

1. INTRODUCTION

Self-regulated learning is the process that help students to self-generate thoughts, feeling, and actions, which are systematically oriented toward attainment of their own goals (Zimmerman and Schunk, 2001).From Winne(1995) point of view, self-regulated learning is an inherently constructive and self-directed process. Self-regulated learning has an important role in learning, specially, and in life generally, so that it has been heavily researched over the past decades. Many influential education psychologists have proposed theoretical models and set up cross-sectional and longitudinal studies to produce theoretically relevant as well as pragmatic information about self-regulated learning. This paper is about relationship of cognitive learning style and self-regulated learning.

1-1 Theoretically literature

There are three different schools of thought in self-regulated learning field, namely research on learning styles, research on metacognition and regulation styles, theories of the self, such as goal-directed behavior, that contributed to our understanding of self-regulated learning. Research on learning style has tried to show the underlying process of self-regulated learning. In this way, Boekaerts (1999) pointed out "self-regulated learning is not an event but, rather, refers to a series of reciprocally related cognitive and affective processes that operate together on different components of the information processing System". Boekaerts' conceptual model of self-regulated learning is a three-layer model that innermost layer of it shows cognitive regulation strategies or learning style which is essential for describing quality of regulation process. Middle layer refers to using metacognitive knowledge and skills to direct learning. External layer relates to "self" and motivation.

One of the key issues in self-regulated learning specially, in innermost layer, is the students' ability to select, combine, and coordinate cognitive strategies in an effective way called learning styles (Boekaerts, 1999). Researchers in self-regulated learning domain defined learning style as the characteristic modes of organizing and controlling cognitive processes (Biggs, 1987, Entwistle, 1988, Marton& Säljö, 1984, Pask, 1988).Learning style research has been mainly taxonomic in nature, seeking to identify the typical way that students process academic information. Several characteristic ways of learning were identified. Pask (1988) introduced two styles including holistic and serialistic. Students situated in holistic extreme have a global approach, focusing on main ideas and constructing an overall conception of the information before paying attention to the details. In contrast, students in serialistic extreme prefer linear tasks, and pay attention to procedural information and operational details. Surface and deep approaches are two learning styles that have

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been introduced by Marton and Säljö (1984). A surface level processing is characteristic of students who mainly rehearse and memorize the study materials; and a deep level processing has been seen in students who want to understand the material and spontaneously relate ideas and arguments expressed by others to their own experiences and to the evidence provided. Entwistle (1988) also classified three learning styles consisting of reproducing orientation (memorization), achieving orientation (trying to acquire high grades) and meaning orientation (a search for personal understanding).Similarly Biggs(1987) introduced three learning styles, labeling them utilizing, internalizing and achieving, and each corresponding to a particular study motivation: extrinsic, intrinsic and achievement motivation. Geisler- Bernstein, Schmeck and Hetherington(1996) discerned five type of cognitive learning strategies: deep learning, elaborating processing, a gentic learning, methodical learning and literal memorization. Finally Vermunt (1992) distinguished three styles that are deeplevel processing, surface level processing, and concrete and related each to a different regulation style, namely external regulation, internal regulation and out of control. Some students regulate their learning internally when they set learning goals and don't need others' training and guidance for selecting a learning strategy or problem solving, while people who are dependent others to beginning and fulfilling the task need others' regulation to direct their learning (Boekaerts& Simons, 1995).Vermunt(1992) and Vermetten, Vermunt and Lodewijks(1995) provide evidences for the hypothesis that deep processing style relates to learning environments in which internal regulation is possible while surface processing coincides with external regulation.

Coffield, Moseley, Hall and Ecclestone (2004) and Rayner (2007) consider learning style as a metacognition process. Peterson, Rayner, Armstrong and Dean (2008) and Cassidy (2012) does refer to learning style along with academic personal control and metacognition skill as major influences in the development of self-regulated learning theory.

1-2 Empirical literature

The evidences show that people with different learning styles prefer to use different self-regulated learning strategies. For example, in Shannon' study (2008) high school students were surveyed using Perceptual modality Preference Survey(Cherry, 1981) to determine their dominant learning styles including Printed, Aural, Interactive, Visual, Haptic, Kinesthetic and Olfactory. Students were then introduced to a new metacognitive strategy each week and asked to apply the strategy to their daily learning processes. Finally, they were asked to reflect on which metacognitive strategies best fit their learning styles. The results were then tallied to determine which strategies were preferred within the seven learning style groups. Kinesthetic people preferred selecting strategies, where they were given a direct involvement in selecting how to present the material they learned. Conversely, interactive learners(verbally), preferred critiquing and revising, where they were allowed to share their opinions with others. Interactive learners were able to gain a greater depth of knowledge from the information that was shared within their study groups. Similar to kinesthetic learners, haptic learners also preferred selecting strategies, which allowed them to have 'hands-on' contact with the materials they were studying. Visual learners preferred self-questioning and predicting outcomes where they were able to use different forms of visual diagrams to help evaluate their learning processes. Printed learners, which refer to seeing printed or written words, preferred self-assessing, where they were able to reflect, usually in form of a journal, to evaluate their learning processes. Finally, aural learners preferred questioning by the teacher, where the students were able to gain perspective from others. These students preferred to present information in form of questions and often struggled to take visual notes.

Some observations showed that learning approaches as a process can be used to help writers become self-regulated learners. For example, Zimmerman and Kitsantas (1997), concluded changing goal from process to result leads to promote individual's performance, and Evenz, Carby and Fabriger (2003) observed interactive relationship between approach to learning and self-regulated learning in writing process. This conclusion has been confirmed by August-Brady (2005),when he introduced a metacognitive activity to people in their study, deep approach and self-regulated learning increased. Therefore, he thinks these concepts have covariance together. Lienemann and Reid (2008)also observed Self-regulated learning strategies and approaches to learning are simultaneously used when engaging in activity such writing tasks. In this way Magno (2009c) tested a model showing the shift from process to outcome in writing by assessing the path from approaches to learning to self-regulated learning as used in composition writing in English. The results showed deep approach significantly correlated to the factors of self-regulated learning strategies except for seeking assistance and environmental structuring while Surface approach did not; deep approach significantly increased the variance in all self-regulated learning strategies while surface approach only increased the variance in memory strategy. Magno (2009b) have been showed that both surface and deep approach to learning increase using of metacognition strategies that reflect regulation of cognition.

Because, there is no study about relationship of self-regulated learning and cognitive learning style, and more information is still needed in this field So, the aim of this study is to examine the relationship between self-regulated learning and cognitive learning style(field dependent/independent), a concept that relates to

how people perceive, think, solve problems, learn, and relate to others, and to what extent individuals' perception is influenced by field (Hayes &Allinson,1997). We hypothesized that cognitive learning style justify the score of students in some self-regulated learning strategies. The question is the use of which strategies are predicted by students' cognitive learning style score. Witkin, Oltman, Raskin, & Kart (1971) argued that cognitive learning styles are concerned with the form rather than the content of the learning activity. So, it's not considered a special content or activity in this study.

2-METHOD

2-1 Research method

This paper used quantitative method in social sciences and questionnaire techniques in the manner of SPSS. **2-2 Population and sample size**

Population was students of Islamic Azad University Azadshar branch (19-25 years old), registered in psychology courses at 2013 (N= 300). Sample size was180 persons that selected through cluster sampling. One hundred and seventy students(100 female,60 male and 10 missing)fill and return the questionnaires. According to approximately small N, and Klein' (1998) notion "sample size 100-200 considered medium sample".

2-3 Measures

Group Figure Embedded Test (GFET)

Group Figure Embedded Test provided by Witkin, et al(1971), assess individuals' degree of filed (in) dependency. Group Embedded Figures Test (GEFT) is a perceptual test which requires the subject to locate a previously seen figure within a larger complex figure. The GEFT, which is comprised of 18 complex figures, can be administered in 20 minutes and can be quickly scored using answer templates from the test distributor. The higher the score, the more field-independent the subject, and the lower the score the more field-dependent the subject is.

Motivated Strategies for Learning Questionnaire

The Motivated Strategies for Learning Questionnaire (MSLQ) is an instrument for measuring motivation and learning strategies that provided by Pintrich, Smith, Garcia, and McKeachie(1991). Only five scales in learning strategies section are relevant to self-regulated learning and were used in this study. They were: **Resource management** is regulation one's physical, and social environment and time of study, seeking information and structuring environment for learning (pintrich, 2000).

Effort regulation, ability to deal with failure and building resiliency to setbacks and the tendency to maintain focus and effort toward goals despite potential distractions (corno, 1994).

Peer learning, Peer learning essentially refers to students learning with and from each other as fellow learners without any implied authority to any individual, based on the tenet that "Students learn a great deal by explaining their ideas to others and by participating in activities in which they can learn from their peers" (Boud, 2001).

Help seeking, able to seek help when necessary, which supports the perspective that seeking academic assistance reflects an appropriate, strategic response to learning (Karabenick, 2004)?

Metacognitive strategies are sequential processes that one uses to control cognitive activities, and to ensure that a cognitive goal (e.g., understanding a text) has been met. These processes help to regulate and oversee learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities (Metcalfe, Shimamura, 1994).

Answers were given on a 7-point Likert scale ranging from 1 (not at all true of me) to 7 (very true of me. The persian form of MSLQ frequently used by researchers. It's validity has been confirmed (Hosayni Nasab& Ramshe, 2000; Kharrazi &Karshki, 2010). In this research Cronbach's Alfa for self-regulated learning strategies were: resource management 0/61,effort regulation 0/75, metacognition regulation 0/71, peer learning 0/82 and help seeking 0/79. Confirmatory Factor Analysis showed good fitness.

3-RESULTS

Descriptive statistics and Kolmogorov-Smirnov normality test of two variables, self-regulated learning strategies and cognitive learning style were reported and correlations of self-regulated learning strategies and cognitive learning style were conducted using Pearson r.

variables	Mean	Std. Deviation	K-S	P-Value
Help seeking strategy	5.05	0.98	0.79	0.56
Peer learning strategy	4.15	1.367	0.93	0.35
Effort regulation strategy	4.25	1.12	0.85	0.47
Resource management strategy	4.90	0.75	0.69	0.72
Metacognitive strategy	4.01	0.65	0.71	0.69
Cognitive learning style	9.41	4.57	1.20	0.112

Table1. Descriptive statistics and Kolmogorov-Smirnov normality testfor variables(N=170)

The mean of most students 'scores for self-regulated learning strategies and cognitive learning style are around the middle, except for help seeking and resource management, with scores around 5.00; Score distributions tend to normal distribution.

Table2 Correlations between all variables									
Variables	1	2	3	4	5	6			
1-Cognitive learning style	1								
2-help seeking strategy	262**	1							
3-peer learning strategy	087	.334**	1						
4-effort regulation strategy	014	158	.010	1					
5-resource management strategy	.008	.137	.099	.314**	1				
6-metacognitive strategy	.007	.237*	.274**	087	.306**	1			

Table2 Correlations between all variables

**. Correlation is significant at the 0.01 level (2- tailed).*. Correlation is significant at the 0.05 level (2-tailed).

The cognitive learning style correlated significantly just with help seeking strategy. Peer learning and acognitive strategies correlated significantly with help seeking. So, partial correlation between cognitive

metacognitive strategies correlated significantly with help seeking. So, partial correlation between cognitive learning style and help seeking strategy with Peer learning and metacognitive strategies as the covariate variables conducted and result showed significant correlation of -0/266, that means there was not any covariate effect. The relationship among resource management and effort regulation strategies, metacognitive and peer learning strategies were significant.

Figure1 Path Model from cognitive learning style to self-regulated learning strategies



The path model was tested where cognitive learning style directly affects self-regulated learning strategies. The result showed that cognitive learning style significantly affect the variance just in help seeking strategy. The goodness of fit of the model was not adequate (CMIN=29/9, CMIN/DF=2/9, RMSEA=0/055. GFI=0/89 and AGFI=0/87). This means that the observations represented well the path model. There was not any indirect effect in the model.

4-DISCUSSION

The present study tested the effect of cognitive learning style on five self-regulated learning strategies. When the relationship between cognitive learning style and self-regulated learning strategies was established, cognitive learning style significantly correlated negatively to only help seeking strategy. The result of path analysis was likely similar to pattern of correlations. Cognitive learning style decreased significantly help seeking strategy. There was no study on relationship between cognitive learning style and self-regulated learning strategies in literature to compare but, this result is justified by some theories.

This result is justified by Vermunt's idea (1992). From his point of view, deep processing coincides with internal regulation and surface level processing with external do. Some people regulate their learning internally when they set goals and don't need others' instruction and guidance for selecting a learning strategy or problem solving. Reversely, people who are dependent on others to begin and fulfill taskneed others' regulation in order to direct their learning. In this study, the low scores in cognitive learning style coincide with more help seeking that is external regulation.

The result of this research is similar to Magno (2009c), because he observed significant correlation between memory, setting goals, self-evaluation, organization and responsibility strategies except help seeking and environment management with deep approach. In another words Magno (2009c) have been showed help seeking coincide with surface level processing.

There is another aspect to justify the result of this study that is the mediation effect of metacognition in relationship between cognitive learning style and self-regulated learning strategies. According to August-Brady(2005), when a metacognitive activity was introduced to people, deep approach and self-regulation increased so, these concepts have covariance. In this study, the mean of students' scores in Group Embedded Figures Test and in metacognitive strategies was9.5 and 3.98 respectively that are middle scores. Therefore, lack of relationship between cognitive learning styles and self-regulation and middle scores in cognitive learning style may be due to low metacognition scores. In the same ground, Coffield et al(2004) considered learning style as a metacognitive process and believed that future education applications of learning styles may require the development of metacognitive knowledge and awareness. Boekaerts (1997, 1999) and Peterson et al(2008) view learning style and metacognitive skills along with academic personal control as a main effect in development of self-regulated learning strategies theory, and Cassidy(2012) considered learning style, self-evaluation and academic personal control as a axial constructions of fundamental processes and drew their interactive effects in self-regulated learning strategies.

It was the intention of this study to identify instrumental constructs in development self-regulated learning skills and emphasize that. Anyway, this study considers self-regulated learning generally not in terms of special activity such as mathematics. This may be considered a limitation of the study but, according to Winne (1995), self-regulated learning is an inherently constructive and self-directed process so, in this study self-regulated learning strategies have been assessed like personality traits.

The population was just psychology students and it may influence the result by reducing variance. It is suggested to repeat the study with the other valid tests and interviews, with different populations, bigger sample size and determining mediator variables. Studies with aim of unfolding influential variables on self-regulated learning strategies can help managers and parents to know self-regulated learning processes and its importance in learning and life, and to plan to develop self-regulated learning strategies and skills in students.

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