Relationship between self-regulated learning strategies with academic achievement: A meta-analysis

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Abstract— the research literature has paid a great deal of attention to the ability of students to self-regulate their learning. Considering the important role of self-regulatory strategies in learning, a meta-analysis was conducted to study the relationship between self-regulatory strategies and academic achievement. In order to conduct meta-analysis technique, the effect size of the relationship of academic achievement and self-regulatory strategies were identified. Among 31 studies, 16 of which were checked against pre-determined criteria for eligibility of relevance. This study was based on 4088 samples and 16 effect size. The effect size of the study was computed by Hunter & Schmidt’s stages of meta-analysis. The results of the study revealed that the mean of effect size of the relationship between cognitive and meta-cognitive strategies with academic achievement based on Cohen’s table (r=0.29). The effect size of cognitive strategies (r=0.41) were established. However the combination of the effect size of cognitive and meta-cognitive strategies (r=0.38) were computed. The effect size of relationship between motivational strategies of self-regulated learning (motivational beliefs, achievement motivation, achievement goals, goals orientation, and self-efficacy) and academic achievement (r=0.34) obtained.

Keywords— self-regulation cognitive strategies, metacognitive strategies, motivational strategies, academic achievement, meta-analysis.

I. INTRODUCTION

The research attention in school setting focuses on self-regulation of human cognition and learning, which is frequently refers to as a self-regulated learning (SRL). Self-regulated learning is a complex process, containing cognitive, meta-cognitive, motivational, and contextual elements. Self-regulated students can control their performance before, during and after learning.

Self-regulation is a process in which students activate, take control of and evaluate their learning. Self-regulated learners are aware of their strengths and weaknesses. Utilize metacognitive strategies, attribute their success and failures to controllable factors.

Pintrich (2000) described self-regulated learning as: an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behavior, guided and constrained by their goals and the contextual features in the environment (P. 453).

In social cognitive theory, Bandura (1997, 2001), related human regulation to three sub-processes: self-observation, self-judgment and self-reaction:

Self-observation refers to the deliberate monitoring of one's activities. Self-observation is very critical to the regulation of performance, which may lead to higher motivation.

Self-judgment refers to evaluating one's current performance levels compared to the goal level.

Self-reaction refers to one's behavioral cognitive and affective to the responses to self-judgments. Self-reactions can be motivating if one’s believes lead to the idea of achieving progress toward their goals.

Zimerman (1998) expanded this model in three phase cyclical loop.

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during this stage to help a learner’s success. Metacognitive strategies, preliminary self-evaluation and motivational strategies in this phase are identified.

Self-reflection is the final phase in which the learners reflect on their performance. The outcome of the reflection is critical in the learner action. If it is positive, the learner will continue to use the methods established to set and proceed toward future goals. Otherwise, learner will reevaluate and make necessary adjustments for future goals.

II. COGNITIVE STRATEGIES

The rehearsal strategies are employed by learners to remember materials using repetition. Some of rehearsal strategies include repeating the material aloud. Copping the material, taking selective notes and understanding the most important part of the material.

Elaboration is the process by which the learner builds an internal connection between what is being learned and previous knowledge. Specific strategies include, paraphrasing, summarizing, and creating analogies, generative note-taking and question answering.

Organization makes the information processing deeper. In this process the learner makes connections with the information received in the learning environment. Specifically, the learner may select the main ideas through outlining, networking and diagramming the information.

III. META-COGNITIVE STRATEGIES

The theoretical framework of self-regulation is based on the ways people organize their meta-cognition. The meta-cognitive strategies may provide students with the most promising tools to enhance their academic achievement. Meta-cognitive strategies include planning, monitoring, and self-regulation.

Planning strategies such as skimming the materials, monitoring self-regulated strategies such as self-testing and test-taking, attention focus have been utilized by high achieving students (Zimmerman & Martinez Pons, 1986).

In the process of monitoring the learners check themselves for comprehension of knowledge or skills. Regulating strategies involve processes such as adjusting reading rate, re-reading, and reviewing.

IV. MOTIVATIONAL STRATEGIES

Three categories of motivation are distinguished regarding motivation:

Self-efficacy refers to the belief of a learner in his or her ability to accomplish a task successfully. It includes judgment about one's ability to accomplish a task and one's confidence in one's skill to perform the task.

Task value refers to the belief in the relevance and importance of a task.

Goal orientation refers to the learner's reason to engage in a task. Either he or she is intrinsically or extrinsically motivated to be participating in a task.

V. METHODOLOGY

A meta-analysis was conducted to accumulate an overall correlation coefficient(r) from a set of independent correlational studies. Two methods of meta-analysis are used:

Hedages and olkin, 1985), and Hunter Schmidt’s method which is effectively a weighted mean of the raw correlation coefficient (Schmidt and Hunter, 1990).

In the present study, correlational results across independent studies, between 2005_2013 that address a related set of questions, were accumulated. The literature base was thoroughly searched for correlational studies relevant to the question of the study “what is the relationship between self-regulated learning and academic achievement” were selected. 31 studies which were on the relationship between academic achievement and self-regulated learning were selected and checked against pre-determined criteria for eligibility of relevance. As a result 16 of the studies were selected and become the data base for the subsequent analysis.

Results and discussion

Meta-analysis is a statistical technique by which the quantitative results of multiple studies focusing on particular question are combined.

The unit of analysis in the present study was not the individual participant, but the effect size found based on the primary studies. Effect size can be estimated based on Cohen’s (1999), the effect size .01, .03, .05 respectively small, moderate(average) and large.

**Effect size of cognitive, metacognitive, and …**

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Predictive</th>
<th>Criterion</th>
<th>N</th>
<th>Mean of effect size</th>
<th>SD of effect size</th>
<th>Error of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive</td>
<td>Self-regulated learning</td>
<td>academic performance</td>
<td>10</td>
<td>0.41</td>
<td>0.23</td>
<td>.07</td>
</tr>
<tr>
<td>Meta cognitive</td>
<td>Self-regulated learning</td>
<td>academic performance</td>
<td>6</td>
<td>0.29</td>
<td>0.17</td>
<td>.04</td>
</tr>
<tr>
<td>Motivation</td>
<td>Self-regulated learning</td>
<td>academic performance</td>
<td>8</td>
<td>0.34</td>
<td>0.21</td>
<td>.53</td>
</tr>
<tr>
<td>Cognitive and meta cognitive</td>
<td>Self-regulated learning</td>
<td>academic performance</td>
<td>16</td>
<td>0.38</td>
<td>0.18</td>
<td>.03</td>
</tr>
</tbody>
</table>

The effect size of cognitive strategies based on Cohen’s table was above average (r=0.41). The effect size of the metacognitive strategies was(r=0.29) which is around average based on Cohen’s table. However, the combination of the effect size of cognitive and meta-cognitive strategies based on
the Cohen’s table was above average (r=0.38) the effect size of motivational strategies was also above average (r=0.34).

The relationship between self-regulated learning with academic achievement is highly important for learning and instruction. For this reason, education should help students to be aware of their thinking, to be strategic in their thinking, motivation toward valuable goals.

Zimmerman (1998), showed the importance of skilled self-regulated students and naïve self-regulated students as follow:

Since we need self-regulatory strategies throughout entire life proper self-regulation habits can lead to a work ethic—a belief in the value of hard work. That affects continued motivation in task beyond school.

REFERENCES
