The impact of cognitive and metacognitive strategies on self-esteem and self-efficacy in students

Mitra Sadat Noghabae
Counselor of Nikan High School, Tehran Education and Training, 2nd region, Iran

Abstract

Self-esteem and academic self-efficacy are the key variables in educational systems that provide the field of growth and cognitive improvement, students’ attitudes and skills; therefore, conducting the programs that provide the flourishing field of these variables are with great importance. Academic achievement is influenced by many variables. Some of the most important are cognitive and metacognitive learning strategies, self-efficacy, creativity and emotional intelligence, etc. This study aimed to investigate the effects of cognitive and metacognitive strategies on self-esteem and self-efficacy in students. The method to conduct the study was quantitative and from the branch of descriptive-survey study, and the group of applied studies. The statistical population of the study was first grade high school students in Tehran in 2015-2016 school year that due to the nature of the study, 60 students were selected. The main tools of the study were the questionnaire of cognitive and metacognitive strategies, self-esteem and academic self-efficacy. The results showed that cognitive and metacognitive strategies have significant and positive effects on students’ self-esteem and academic self-efficacy.

Keywords: Cognitive strategies, metacognitive strategies, self-esteem, academic self-efficacy.
Introduction and statement of the problem
Self-esteem, sense of values, the degree of approval, acceptance and worth are the things that individuals feel about themselves (1993, Shamloo). When it comes to self-esteem, personal values or an individual’s feelings pictured to the members of the group are presented. One of the most complicated and upsetting personality problems is inferiority complex. Children having incompetence and backwardness feelings make less effort for success and doing things. Healthy growth of personality requires that an individual to work not only for recognizing themselves but also for their acceptance. Valuable studies were done about the relationship between individual self-recognition in relation to the healthy growth and personality adjustments and showed positive and beneficial results (Parsa, 1997). The problems related to learning and academic achievement are rooted in interpersonal and Intrapersonal problems. Interpersonal problems are rooted in students' personality characteristics and psychological characteristics; while intrapersonal problems are rooted in cultural, social, educational factors, how teachers teach and deal with classes (Mohsenpoor, et.al, 2006). Cognitive and metacognitive learning strategies, self-efficacy, creativity and emotional intelligence are among the major interpersonal problems affecting the academic achievement. Cognitive and metacognitive learning strategies are one of the effective factors on academic achievement. According to theoretical models by Pintrich, Smith, Garcia and Mac Keiji (1998) cognitive learning strategies include mental rehearsal, elaboration and organization and metacognitive learning strategies include critical thinking and metacognitive self-regulation.
Studies show that students who use a high level of cognitive strategies (eg, organization) and metacognitive strategies have higher academic achievement. High-level strategies, will lead students to the consequences of success and high achievement, while low-level strategies lead them to low academic achievement. In summary, studies have shown that there is a significant correlation between students’ widespread use of cognitive and metacognitive strategies and their academic achievement. These studies have generally shown that learners using high level cognitive or metacognitive strategies will achieve great progress in their learning activities. Self-efficacy is among the important concepts in social-cognitive theory by Bandura. In this theory, cognitive processes have a decisive role on human behaviors. Faulty cognitive processes leads to an individual’s false expectations and perceptions of their efficacy and the expectations and perceptions can lead to anxiety and avoiding challenging situations (Pacharz, 2002). In Bandura's theory self-efficacy means to judge people on their ability to organize and execute a series of tasks to achieve types of defined actions (Dices, 2011). Bandura's also defined self-efficacy as individuals’ perception of the degree of control they have over life. People try to control the events that affect their lives. By influencing the opportunities that they can have some control, they are better able to fulfill the desired future and prevent adverse outcomes that this ability provides them numerous personal and social benefits.
Against inability to control the issues that might adversely affect a person's life, it fosters distress, frustration and disappointment (Bandura, 2001). People who have high self-efficacy unlike people who have low self-efficacy choose challenging goals, they see assignments as the challenges they must dominate over them, they feel more relaxed, believe in themselves more, and show more insistent efforts, use more useful learning strategies (metacognitive self-regulation and organization), have better power to remember and remind and their function in doing homework is better. This study aimed to investigate the effects of cognitive and metacognitive strategies on self-esteem and academic self-efficacy in students. In other words in this study the researcher is looking for to see if cognitive and metacognitive strategies have significant effects on students’ self-esteem and academic self-efficacy or not.

Theoretical principles and review of literature

**Cognitive and metacognitive strategies**

Cognitive and metacognitive strategies are the measures that will help learning, and remembering. However, these strategies can be learned, but some of the learners cannot learn and they are required to be trained (Seif, 2011). Whatever the strategies that students use properly to be widespread, their success in problem solving, reading, comprehension and outsourcing more information will be more (farokhi, 2010). The learners who are aware of their styles in reading and learning and consciously choose some activities to improve them, they learn more than the learners less aware of these issues, they consciously and by the use of their metacognitive knowledge coordinate specific strategies with particular goals of learning (Eggen & Kauchak, 2001). Although Gagne does not distinct recognition and metacognition, but their distinction is that recognition process is related to thought while metacognition is related to thinking about thought. The term recognition is referred to internal mental processes or ways in which information is processed. It means the ways by which information is considered, recognized, coded, and stored in memory and is used when it is needed (Bilere & Showman, 1993). In every day recognition in everyday language means knowing but in Psycholinguistics it means thinking and learning flows and how to organize, store and apply information (Gage & Berliner, 1994). Dari and Murphy (1986) said that cognitive strategies include ways through which people manage their learning, recall and think. Hendry (2000) knows cognitive strategies as projects or approaches to solve a problem. He believes that cognitive strategies are some explorations to process information. People in the process of gaining information require regulating external stimuli, scientific and creative activities and to this end, the use of cognitive strategies meets the need (Ababaf, 2008). Flavell (1998) knows cognitive process as one of the important process takes place in memory. He believes that the process starts from the emotional step and continues to recover data from long-term memory and since these processes are related to knowing and recognition they are called cognitive processes. In other words, when we identify one thing, remember a name, understand a sentence or express an idea and solve a problem,
recognition is happened. Metacognition also plays an obvious and important role in problem-solving, self-control, self-learning and changing behavior (Niaz Azari, 2003). Shoarinejad (2001) does not know metacognition as a new idea but he believes ancient Greek thinkers found self-recognition worth which was kind of metacognition.

Despite all theories, the term metacognition was not defined as controlling cognitive processes till 1970s. Flavell (2000) expressed meta-cognition as any knowledge or cognitive process whose topic is an aspect of cognitive measures and adjusting them. In other words, he believes that this issue is metacognition because its main meaning is recognizing the recognition. In fact it can be said if recognition meant to receive, process, store and transmit the information, metacognition is an activity which involves actions related to the four elements mentioned and monitor them (Aghazadeh, 2011). Metacognition at least has two parts, knowledge and control. Knowledge means awareness of skills, strategies and a tool for the efficient execution of a task but control needs to use and self-automatic mechanisms to ensure the successful implementation of assignments.

**Self-esteem**

One of the factors affecting students’ academic achievement is self-esteem. Self-esteem is an individual’s satisfaction from themselves and a sense of self-worth (Brandon, 2000); in other words, the purpose of self-esteem is how a person thinks about themselves, how much loves themselves and is pleased with their performance and especially how one socially and educationally feels about themselves and how much is the rate of coordination and closeness of self-ideal and self-fact of an individual (Hosseini et al., 2007). In a study carried out by Ras and Bera (2000), in order to investigate the relationship between self-esteem and academic achievement in 64 students, a group of the students were announced their real scores in the exam and the second group were announced 10 scores below their real scores. The results of the study showed that there is a direct relationship between self-esteem and academic achievement. Also, in other studies it was reported that there was a positive and significant relationship between self-esteem and academic achievement. (Hosseini et al., 2007; Poorsharifi, 1991; Tompson and Angelerleader, 2004) said that the rate of self-esteem among girls is more than among boys and the reason for the girls’ success are their more self-esteem and less anxiety. According Maslow self-esteem is Merits, ability, competence, confidence, independence and freedom. If they were met individuals would feel valuable, capable, and efficient, get the sense of pride and self-confidence, or they would receive the sense of inferiority, helplessness and weakness (Madi, 1976). As Rodgers said self-esteem is continuous evaluation that an individual may have from their personality value (Shamloo, 1989). Rosenberg says every person has some awareness about themselves, some parts of the awareness is called self-esteem. Self-esteem factors include: security, susceptibility, affiliation, commitment, and competence.
Signs of an unhealthy and healthy self-esteem

As children grow and grow, their self-esteem will change as well. The more experience they receive the more new concepts towards themselves they receive and their self-esteem changes based on it. It is good for parents to be vigilant for signs of healthy and unhealthy self-esteem so that they can help their children on time. A child who is suffering from poor self-esteem, is not willing to learn or do not learn something new. They always have a negative view of themselves and say sentences like I'm an idiot, I never learn any things, and nobody notice me. Children, who have low self-esteem, think sustainable problems are forever and see the situation unbearable. In other words, the pessimism is dominant and prevails. In contrast, a child who has high self-esteem enjoys socializing with others in social circles and doing group activities as well as doing individual and personal activities and feels satisfied and comfortable. They welcome the new measures and when faced with a problem find solutions in their own ability. They never underestimate their talents and accept their inner shortcomings. For example, instead of saying: I am an idiot, says: I do not understand it. They are aware of their strengths and weaknesses and the sense of optimism and positive are dominant in themselves (Salahshoor, 2000).

Academic self-efficacy

According to people’s beliefs self-efficacy is individuals’ ability to learn and practice in a certain level (Bandura, 1986). Many studies have concluded that the self-efficacy affects learning, motivation and academic performance (Singh et al., 2013; Stevens et al., 2012). Self-efficacy is a concept extracted from a widespread theory named social-cognitive theory that based on this theory individuals’ progress is affected by their behaviors, environmental condition and inner characteristics such as their thoughts and beliefs (Bandura, 1988). Learners’ imagination of self-efficacy is resulted in different sources such as their real performance and physiological responses, encouraging others and experiences achieved through observations. By increasing the rate of learners’ self-efficacy their academic performances will increase and show more readiness and endurance than those with lower self-efficacy (Scherer, 2013). Primary academic self-efficacy is due to talent, previous learning experience and social support (Shank, 1995). Thus students with previous learning experiences show higher academic self-efficacy. Even self-efficacy may be generalized to other areas apparently unrelated to education. For example, students who believed in the planning and management of a research or homework to do will continue the same trend for the rest of their lives (Pajars and Shank, 2001 translated by Kabiri, 2008). Researchers conducted on cognitive and metacognitive strategies have shown that the use of these measures will enhance learners’ learning (Beckman, 2002). This effect is especially impressive for learners face somehow with learning difficulties, (Maleki, 2005). Motavali (1997) concluded that the use of metacognitive strategies with the ability to read, are related to comprehension and learning speed. Ebrahimi Ghavam Abadi (1998) also concluded that teaching such strategies has a positive relationship with comprehension and speed of learning as well as
positive self-concept, planning and problem solving ability. Abdoos (2001) also positively assessed the effect of metacognitive strategies on creativity. Mokhtari (2002) in his study about the relationship of managers’ self-efficacy with students’ achievement showed there is not a significant relationship between managers’ self-efficacy and students’ achievement. There is no significant difference between male and female managers’ self-efficacy. Nosrati (2008) by examining the relationship between self-efficacy and effectiveness of the leadership among school principals revealed that there is a significant relationship between self-efficacy and effectiveness of educational leadership. Arabian (2004) examined the relationship between self-efficacy beliefs on students’ mental health and academic success and found that high self-efficacy had a positive effect on students’ mental health. Enayati (2003) studied the relationship between managers’ self-concept and their performance at school and concluded there is a significant positive relationship between them. Koslowsky et al (2009) investigated the relationship between teachers’ self-efficacy and group activities and providing successful models and concluded that there is a significant relationship between teachers’ presentation of successful models and group activities and their self-efficacy.

Research purposes
This study mainly aimed to investigate the effects of cognitive and metacognitive strategies on self-esteem and self-efficacy in students.

Secondary purposes
- Determining the effectiveness of cognitive strategies on students’ self-esteem;
- Determining the effectiveness of cognitive strategies on students’ academic self-efficacy;
- Determining the effectiveness of metacognitive strategies on students’ self-esteem;
- Determining the effectiveness of metacognitive strategies on students’ academic self-efficacy;

Research questions
1. Do cognitive strategies have significant effects on students’ self-esteem?
2. Do cognitive strategies have significant effects on students’ academic self-efficacy?
3. Do metacognitive strategies have significant effects on students’ self-esteem?
4. Do metacognitive strategies have significant effects on students’ academic self-efficacy?

Research hypotheses:
1. Cognitive strategies have significant effects on students’ self-esteem.
2. Cognitive strategies have significant effects on students’ academic self-efficacy.
3. Metacognitive strategies have significant effects on students’ self-esteem.
4. Metacognitive strategies have significant effects on students’ academic self-efficacy.

Methodology
The method to conduct the study was quantitative and from the branch of descriptive-survey study, and the group of applied studies. In terms of the relationship between variables, it is correlational and regression in the field of applied research. The statistical population of the study was first grade high school students in Tehran in 2015-2016 school year that due to the nature of the study, 60 students were selected. The main tools of the study were the questionnaire of cognitive and metacognitive strategies, self-esteem and academic self-efficacy. Cooper's Self-Esteem Scale, Bandura's self-efficacy questionnaire, and researcher-made cognitive and metacognitive strategies questionnaire were the main tools of this study. SPSS software version 22 and linear regression were used to analyze data.

**Findings**

- Cognitive strategies have significant effects on students’ self-esteem.
- Cognitive strategies have significant effects on students’ academic self-efficacy.
- Metacognitive strategies have significant effects on students’ self-esteem.
- Metacognitive strategies have significant effects on students’ academic self-efficacy.

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According to the table above and the level of significance of these tests which are less than 5 percent, research hypotheses are confirmed. It can be said that the two variables, cognitive and metacognitive strategies have positive and significant effects on students’ self-esteem and academic self-efficacy.

**Discussion and conclusion**

Basically, meta-cognitive learning strategies and increase academic self-efficacy and will be more characterized by internal attributions educational efforts, while cognitive learning strategies are accompanied with external attributions, uncontrollable causes in academic success and less self-efficacy. Students whose attributions in academic achievement is focused more on their self-attempts and higher self-efficacy and deeper learning, use metacognitive strategies more and the students whose attributions in education is focused on uncontrollable factors, have lower self-efficacy and superficial learning, use cognitive strategies more. Even the newest findings by Paul, Silvi and others about the attributions, recognitions and coping strategies revealed that...
internal attributions are more accompanied with problem-focused coping strategies and job-related psychological positive results and negative attributions are accompanied with emotion-focused coping strategies and related psychological negative consequences associated with the job.

Educational systems can increase the rate of students’ self-efficacy in different ways. One of important ways to improve self-efficacy is to apply thinking ways instead of ways to learn thinking. Most experts believe that teaching methods based on metacognition principles and methods can contribute to the educational systems in the fulfillment of this mission. One of the reasons that many researchers are interested in the field of metacognition is that they believe that this area has important implications in the field of education. For example, Baker, Baker and Brown, Brown et al., Flavell, Marx and Paris believe that meta-cognitive skills play an important role in a variety of cognitive activities including verbal exchange of information, good reading comprehension, motivation, verbal comprehension, writing, language learning, perception, attention, memory, problem solving, and social cognition. In a meta-analysis, Wang et al. (quoted by Mostafaei and Mahbubi, 2006) about the factors effective on students’ learning concluded that among 228 factors effective on learning, cognitive and metacognitive strategies have the most effects on students’ learning. In general, teaching metacognitive strategies provide individuals academic involvement, internal locus of control, positive attributions, higher achievement motivation, creativity, productivity and self-responsibility and reinforce individuals’ self-confidence in life affairs and enable them to identify problems, test their activities, act freely and on themselves and offer the best solutions in different issues.

Madraki (2007) studied the relationship between teacher’s self-efficacy, students’ math self-efficacy with their performances and concluded that teaching metacognitive strategies to individuals improves their performances in doing their tasks and academic achievements. Kharazi (2008) studied the relationship between progress purposes, self-efficacy and metacognitive strategies and concluded that metacognitive strategies are effective on individuals’ self-efficacy. Malakzadeh (2009) in a study investigated the effects of teaching self-regulating strategies on girl students’ learning strategies, self-efficacy and achievement purposes in math. Ghazitabatabaei and Tarkhani (2010) studied structural pattern of self-efficacy relationship, perceived usefulness and academic achievement and showed that self-efficacy and perceived usefulness of learning directly and through self-regulation have an effect on academic achievement. Zahrkar, Reazadeh and Aghgar (2010) studied the effectiveness of teaching problem solving skills on self-efficacy of high school female students in Rasht and concluded that the rate of self-efficacy of students who received problem-solving skills is more than the self-efficacy of students who did not receive training in problem solving. Evaluating the studies indicate that self-efficacy is one of the factors that regulate behavior; leads to self-regulation and improves the quality of life; prepares people for ambiguous and challenging situations; provides the fields of identifying the actual capacity and increases self-acceptance and self-esteem.
Studies also showed that various factors have impacts to nurture and increase individuals’ self-efficacy. One of the most important factors is teaching strategies and metacognitive skills. By teaching the skills and metacognitive skills it is possible to improve learners’ decision-making skills, interaction with others, planning, thinking deeply, constructive judgment, respecting conflict of interests, peaceful coexistence and self-regulation and self-evaluation. The use of superficial learning strategies based on external attribution style is not appropriate with new expectations of learning. In the learning environments students are expected to process the materials learned more and act more independently. This issue will be related with sex which based on the male and female gender in terms of motivation, personality, performance and controllability are different and identifying learning strategies and their attribution styles can provide the field of arming them to expertise and knowledge which enable them to achieve deeper levels of processing concepts and self-regulated learning which is the central goal of education and finally stop many misunderstandings between teachers and students and prevent harmful phenomena such as academic failure and provides training to help growth and sustainable development of society. Based on the findings it is recommended that education and training systems to avoid banking and learn like parrots and institutionalize the teaching-learning process significantly and train thoughtful and self-reflected and self-evaluated learners, they should think of mechanisms through which students are taught how to learn so that their level of efficiency, ie meditation, focus, responsibility, self-initiated, creation and problem solving, introspection and self-evaluation to be improved. Undoubtedly one of the most important mechanisms are resorting to strategies and training cognitive and metacognitive skills.
References


