A descriptive study: epistemological beliefs and self regulated learning

Nilgun AKSAN*

Gazi Unv. Postgraduate Student

Received October 23, 2008; revised December 25, 2008; accepted January 6, 2009

Abstract
This study is descriptively aimed to make the relationships between epistemological beliefs and self regulated learning clear. Through the aim of the research, the national and international literatures related to epistemological beliefs and self regulated learning are reviewed. Eventually, it is attained that self regulated learning provides the positive epistemological beliefs about the individual’s own ability, the value of learning, the factors affecting learning, guessing the result of activities, concentrating on instruction etc. Furthermore, it is attained that the poor self regulation skills cause low motivation and poor learning. Self regulation skills assist to the learners for selecting the suitable learning strategies for their aims and using its procedures. Therefore the learners need to know how they learn and how the learning is materialized.

© 2009 Elsevier Ltd. Open access under CC BY-NC-ND license.

Keywords: Learning, epistemological belief, self regulated learning, motivation.

1.Introduction
Learning necessities of a person who needs advices to avoid himself/herself from junks or the person who needs private courses to improve his/her Spanish; or the person waiting for help to improve his/her ability of oration or the person who cannot solve the Einstein’s theory are relatively different from one another; thereby, their learning types differ from each other. In the first situation giving up a habit, in the second a knowledge narration to the memory, in the third teaching a complicated and new ability and in the last, teaching a very abstract concept will be carried out (Philips & Soltis, 2005). Thus, different strategies for the each situation are required. At this stage, strategy for the first situation may not be functional in the second one. In this sense, the question of how the learner will determine the strategy of learning for the each situation gains importance. One’s understanding his/her own

---

E-mail address: aksannilgun@yahoo.com.

1877-0428 © 2009 Elsevier Ltd. Open access under CC BY-NC-ND license.
doi:10.1016/j.sbspro.2009.01.159
learning process and arranging these processes according to his/her qualities can only be fulfilled if he/she has self-regulatory ability.

Recent researches show that motivational elements are important in learning process, as well as behavioural and cognitive elements. Especially researches in the last two decades have revealed that epistemological beliefs and self-regulatory skills affect the learning processes of the individuals. Two motivational processes are underscored in this research.

**Epistemological Beliefs**

Subjective beliefs of the individuals related to what knowledge is or how learning takes place are conceptualized as *epistemological beliefs*. Epistemological beliefs reflect the individual opinions concerning the questions such as “what is knowledge?”, “how is knowledge gained?”, “what is the accuracy degree of the knowledge?”, “what are the criterias and limits for knowledge?”, “is knowledge something that happens without student or is it gained after it is loaded by authority figures of the disciplinary areas (experts), or is it gained by interaction in the light of disciplinary areas?” (Ravindran, Grene ve Debacker, 2000; Hofer ve Pintrich, 1997; Brownlee, Purdie ve Boulton-Lewis, 2001).

Beliefs are based on the emotions, assessments and judgements that the individual approves as true, concerning what and how a certain person, object or situation is. Beliefs have strong and efficient characteristics in all decisions that people take, choices that people choose and behaviours that people act (Deryakulu, 2004). Because man develops a belief about what the things in the exterior world are through their perception which is one of the basic sources of his knowledge and this developed belief makes him a person tended to do that certain behaviour (Gunday, 2003). In this sense, knowing how the learner perceives the things happening both in his environment and in education atmosphere and what kind of belief he/she develops for this, present important clues for the education service that he/she is offered. The way to fix the indifference of the learner to any lesson, his/her learned desperateness or academical failure lies within the determination of what kind of epistemological belief lise under this failure.

Epistemological beliefs affect not only the students’ but also the teachers’ educational and instructional actives in the classroom (such as which teaching techniques and methods will be used, how the class will governed, what will be focused on in the learning process). Epistemological understanding of the teachers largely determines their view of reality and what knowledge is (basing on reality), how this knowledge is learned, taught and produced (Tezci ve Uysal, 2004).

**Self Regulated Learning**

One of the subjects that researchers dwell on is self-regulatory learning approach. The origin of the researches done in this field is to display the failure reasons of unsuccessful students (Alci & Altun, 2007). Most of the self-regulatory theoreticians took the learning as a multi-dimensional process that includes personal, behavioural and contextual components. There is not a sole definition of this process. It has different meanings according to the situation and sector (such as education, industry and trade etc.)

Self-regulated learning presents an important perspective on learning in recent researches of educational psychology. Although there are many different models that are derived from the mix of different theoretical perspectives (Zimmermann’s self-regulatory learning model, Pintrich’s self-regulatory learning model, Winne and Hadwin’s self regulatory learning model), many models assume that self regulatory learning uses cognitive and metacognitive strategies to control and regulate the learnings of the students.

Behaviours cannot be controlled only with exterior reinforces and penalties according to Bandura. People regulate and direct their emotions, thoughts, actions and behaviours largely to themselves (Bandura, 1986; Akt: Haslaman, 2005: 7). This ability, which is called “self-regulatory” and is one of the basic principles of social
learning theory, is shortly the learner’s authority on his/her learning process. Self regulatory ability consists of many sub-processes such as self observation in which one observes his/her own performance and keeps his/her observation records; self judgement in which one compares his/her own performance with a standard or target; self reaction which is called the assessment period of progressing towards the target; or self evaluation (Schunk, 2001; Akt: Yuksel, 2003; Cetin, 2007).

Self regulation does not automatically develop with maturing or cannot be gained passively (inactively) from the environment. Systematical interferences support gaining and developing the self regulatory ability (Weiner, 2003). Self regulatory learning is a process with its this feature. In this process learner learns his/her learning and self control abilities. Furthermore, data related to the learner himself/herself (for instance the data of how he/she acquired that knowledge) is required. Knowing how one learns eases to refer different learning strategies in different situations. Moreover, learner is motivated and homeworks appeal him/her. Because he/she values learning; in this sense, gets more disciplined (Sears, 2002).

Zimmerman (2000) mentions that self regulatory process is a circular process as individual, behavioural and environmental factors are constantly changing. Because of this Zimmermann indicates that self regulatory process consists of three phases: pre-cognition, performance and self reflection. Precognition phase includes the beliefs and preparatory process before the learning process of the individual and performance phase includes the observation and control processes. Students that have self regulation, differ from the other students in the classroom from the point of targets they set for themselves. This difference arises from self observation and strategically thinking (Alci & Altun, 2007). Self reflection, the last phase of the self regulatory process, is assessing the individual’s performance and attributing causative meanings related to this performance.

Epistemological Beliefs and Self Regulated Learning

The researches have revealed the fact that while defining the student’s success, a number of variables shall have to be considered. One of these variables is self regulating learning skill. Awareness by the learner to the extent which skills he has gained, its being implemented consciously, not being daunted by failure, resolution, desire for success and not losing self confidence. Learners with self regulating skills, can command their learning situations by a number of ways (Zimmerman, 1986; Akt: Erktin, 2002: 65).

Learning, independently from age and location, is an activity which will be in progress throughout the lifetime. For the student to take his place at the centre of this activity, is mostly dependent on his bearing the liability of his self learning and his having the competency to orient the learning process and his taking and implementing decisions with respect to this process. In the researches, it was pointed out that the students who play efficient role on their self learning process and who have the knowledge when and how to use their learning approach, shortly students with improved self regulating skills have better academical achievements (see Schunk & Ertmer, 1999; Borkowski & Thorpe, 1994; Haslaman, 2005; Haslaman ve Askar, 2007).

Achievements at the activities that require mental skills is subject to acquisition of the required knowledge in addition to being aware of to what context this information is required and the information about how the aforesaid will be used (Yeap, 1998). Self regulating strategies are intentional individual processes. The learners with self regulating skills are the learners who are active at electing the appropriate learning strategies in compliance with his targets and in using the requirements of these strategies during the process. Schunk & Ertmer (1999: 251-60), pointed out the fact that the self regulating methods are teachable and this will improve the academic accomplishments of the student and his self sufficiency.

Pieschl, Stahl ve Bromme (2007), have inquired about the relation between the epistemological beliefs of the biology students and self regulating learning behaviours. This research have revealed the fact that
epistemological beliefs and self regulating learning are in collaboration with each other and each of them have impact on academic achievements severally. However, in the studies of Bell (2006) and Barnard, Lan, Crooks ve Paton’un (2008) it has been found out that there is a tiny and insignificant relation between epistemological beliefs and academic achievements and that the self regulating learning skills only mediate this tiny and insignificant relation.

Paulsen & Feldman (2005), have examined the impact on each of the six criteria of the self regulating learning strategies motivational compounds (intrinsic goal orientations, extrinsic goal orientation, task value, self-efficacy, control of learning and test anxiety) of the four dimensions of the epistemological beliefs (regarding the ability to learn, the speed of learning, the structure of knowledge, the stability of knowledge. As a consequence for the research, it was discovered that the epistemological beliefs have important impact on the students using self regulating motivational strategies. Despite the fact that the belief by the students on the stability of knowledge had a statistically consequential effect on just one motivational strategy, this thought had four numerically considerable interaction effects with ideas about capability to learn and the structure of knowledge. The over toning of these findings are examined in terms of theory, research, policy and practice.

The researchers have assumed that weak self regulating skill is the cause beyond the lack of motivation and learning in mathematics so far. Self regulation comprises self generalization by the individual of the thoughts, feelings and activities contemplated systematically for the purpose of having an impact on self learning of information and skills (Zimmerman, 1989, 1990; Zimmerman & Kitsantas, 1996; Akt: Schunk, 1998: 138). The self regulating process comprises direct attention to learning and concentration, organizing the informations, coding and repitition; generating a productive business environment, efficient usage of the sources; individual skills of the person, value of learning, factors having an impact on learning and having positive thoughts on estimation of the results of the activities; self satisfaction and proper pride of the individual by personal endevaour (Schunk, 1994; Akt: Schunk, 1998: 138).

The motivational processes are deemed to be the main reason for the lack of success by the American students at mathematics. Many students faces difficulties at learning mathematics. Furthermore, these students have low perception skills for a better learning and performance (Kloosterman, 1988; Stipek & Gralinski, 1991; Akt: Schunk, 1998: 138). Among the Chinese, Japanese and American cultures, the evaluation of students’ skills at mathematics by their mothers and the students evaluate their own skills, directly alters the achievement levels of the students at mathematics (Uttal et.al., 1988; Akt: Schunk, 1998: 138). Another research tells us about the fact that the thoughts about mathematics, achievement characteristics and the beliefs of the parents about the thoughts of their children regarding mathematics, by the Asian origin US citizens and non-Asian origin US citizens differ significantly (Whang & Hancock, 1994).

Uredi & Uredi (2005), have explored to what extent the self regulating strategies and motivational beliefs can predict the achievements on mathematics of the 8th grade students and specified that self regulating strategies and motivational beliefs can describe only 30 % of the total variance with respect to success on mathematics and the most powerful predictor variable was determined to be the usage of cognitive strategies. Moreover, it has been observed by the end of the research, that the prediction power on mathematics of self regulation strategies and motivational beliefs are higher for the boy students than that of the girls.

Isiksal, Kurt, Dogan & Cakiroglu (2007), have examined the epistemological conceptions of the mathematic teacher candidates against mathematics and have also examined the impact of the university studied at and the university class level on these conceptions. As a consequence, it has been discovered that primary school teacher candidates for mathematics perceive mathematical information as a constantly developing field that consists of interactive concepts, principals and generalizations instead of having deemed mathematics as a bundle of informations consisting of certain and unalterable facts, substantiations and rules.

Oksal, Sensekerci & Bilgin (2007), have examined the epistemological beliefs of the teacher candidates at different dimensions. As an outcome for the research, it was pointed out that the teacher candidates were considerably indecisive on taking the science as a basic for information source and have a low tendency in belief for
a rational society. Furthermore, it has also been noticed that the teacher candidates do not affluently consider the superstitious rituals such as dreams, presage etc. as a base for predicting on their futures however, have a significant tendency to believe in fate and hex.

Hofer & Pintrich (1997), emphasize that the belief of the individuals in knowing and the nature of knowledge have a remarkable impact on learning and accomplishment (Akt: Pintrich & Zusho, 2000: 261). Many of the recent researches have pointed out that many factors together and even simultaneously affect the learning process and draw attention on the fact that the learner shall be in a role to regulate, to support and to direct his self learning.

Discussion

Mountrose (2000), states that the feelings that are concealed in subconscious but stored at the body have a powerful energy that can be conducted and in case this energy is not conducted than can randomly appear and can affect the solution of the daily problems. Considering the fact that the things that lie beneath the feelings are the beliefs and beliefs are influential on behaviors, decisions and choices that reveal the feelings, it will easily be detected that the awareness of the learning process by the learner, his directing this process and transmitting the mental capabilities to the learning process are of foremost significance. In this context, it will be reasonable to state that epistemological beliefs have a undeniable affect on utilization of the self regulating strategies.

Considering that the beliefs in one information field shall pioneer the beliefs in another information field, the generation actively of the self information by the students and their being encouraged to adapt this to their learning approach is of significance for their developing own forms of conceptions. The students who believe that the truth is unique will show a tendency to find out single solutions to the problems they face and will act in a manner to adopt the idea that the thoughts by the authority is the truth. However, it is an obligation for the students to search solutions to these problems with their own perception mechanisms, to participate actively in this process and to manage this process. Epistemological beliefs and self regulation skills are an opportunity for such circumstances. The learning process of the students are sensitive and significant. Therefore, it is important for the students to have positive beliefs regarding learning (their belief in finding a solution against a hard problem by exerting effort) in order to assure them to be more sensitive and dominant on the subject that they learn.

References

Alici, B. & Altun, S. (2007). Lise öğrencilerinin matematik dersine yönelik öz düzenlemeleri ve bilisüstü becerileri, cinsiyete, sınıfa ve alanlara göre farklılıklar mıdır? C.U. Sosyal Bilimler Enstitüsü, Cilt: 16, Sayı: 1, sf. 33-44.

Barnard, L., W.Y. Lan, S.M. Crooks & V.O. Paton (2008). The relationship between epistemological beliefs and self regulated learning skills on the online course environment. MERLOT Journal of Online Learning and Teaching, Vol: 4, No: 3, pp. 261-66.

Bell, P. D. (2006). Can factors related to self-regulated learning and epistemological beliefs predict learning achievement in undergraduate asynchronous web-based courses? Perspectives in Health Information Management, 3(7), pp. 1-17.

Borkowski, J.G. & Thorpe, P.K. (1994). Self-regulation of learning and performance. New Jersey: Lawrence-Erlbaum, pp. 45-73.

Brownlee, J., Purdie, N. & Boulton-Lewis, G. (2001). Changing epistemological beliefs in pre-service teacher education students”. Teaching in Higher Education, Vol: 6, No: 2, pp. 247-68.

Cetin, S. (2007). Öz düzenlemeli öğrenme üzerine bir calisma. Hacettepe Üniversitesi Egitim Fakultesi İlköğretim Bölümü I. Ulusal İkogr. Kongresi.

Deryakulu, D. (2004). Epistemolojik İnanclar. Yildiz Kuzgun & Deniz Deryakulu (Edt), Egitimde bireysel farklılıklar, Ankara: Nobel Yayınları.

Erkin, E. (2002). İlköğretimde dünunme becerilerinin geliştirilmesi. M.U. Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, Sayı: 16, sf. 61-70.

Gunduz, S. (2003). Zihin tıbbiyesi. 1. Baskı, Bursa: Asa Yayınları.

Haslaman, T. (2005). Programlama dersi ile ilgili ozdüzlenyici öğrenme stratejileri ile basari arasındaki ilişkilerin incelemesi: bir yapısal esitlik modeli. Hacettepe Üniversitesi Fen Bilimleri Enstitüsü Bilgисayar ve Öğretim Teknolojileri Egitimi Anabilim Dali, Yayınlanmamış Yüksek Lisans Tezi.

Haslaman, T. ve Askar, P. (2007). Programlama dersi ile ilgili ozdüzlenyici öğrenme stratejileri ve basari arasındaki ilişkini incelemesii”. Hacettepe Üniversitesi Egitim Fakültesi Dergisi, 32 (7), sf. 110-22.

Hofer, B.K. & Pintrich, P.R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to earning. Review of Educational Research, 67 (1), pp. 88-140.
Isiksal, M., Kurt, G., Dogan, O. & Cakiroglu, E. (2007). Epistemological conceptions of pre-service elementary mathematics teachers: Effects of university and grade level. *Ilkogretim Online*, 6 (2), sf. 313-21.

Mountrose, P. (2000). *6 ile 18 yas cocuklariyla sorunlari cozmeye bes asama*. Istanbul: Kariyer Yayinlari.

Oksal, A., Sensekerci, E. & Bilgin, A. (2007). Ogretmen adaylarinin yasam teorilerini olusturan merkezi epistemolojik inanclarinin belirlenmesi. *Ilkogretim Online*, 6 (3), sf. 411-21.

Paulsen, M.B. & F.A. Feldman (2005). The conditional and interaction effects of epistemological beliefs on the self regulated learning of college students: Motivational Strategies. *Research in Higher Education*, Vol: 46, No: 7, pp. 731-68.

Philips, D.C. & Solist, J.F. (2005). *Perspectives on learning (Ogrenme: Perspektif)*. Cev: Soner Durmus, 1. Baski, Ankara: Nobel Yayinlari.

Pieschl, S., Stahl, E., & Bromme, R. (2007). Epistemological beliefs and self-regulated learning with hypertext. *Metacognition Learning*, 3, pp. 17-37.

Pintrich, P.R. & Zusho, A. (2000). The development of academic self-regulation: The role of cognitive and motivational factors. Allen Wigfield & Jacquelyne S. Eccles (Eds), *Development of achievement motivation* (pp. 250-71).

Ravindran, B., Grene, B.A. & Debacker, T.K. (2000). Predicting preservice teachers’ cognitive engagement with goals and epistemological beliefs. *Department of Educational Psychology*, pp. 222-32.

Schunk, D.H. (1998). Teaching elementary students to self-regulate practice of mathematical skills with modelling. Schunk, D.H. & B.J. Zimmerman (Eds), *Self-regulated learning from teaching to self-reflective practice*. The Guildord Press.

Schunk, D.H. & Ertmer, P.A. (1999). Self-regulatory processes during computer skill acquisition: Goal and self-evaluative influences. *Journal of Educational Psychology*, 91 (2), pp. 251-60.

Sears, S. (2002). *Contextual teaching and learning a primer for effective instruction*. Bloomington: Phi Delta Kapa Educational Foundation.

Tezci, E. & Uysal, A. (2004). Egitim teknolojisinin gelismesine epistemolojik yaklasimlarin etkisi. *The Turkish Online Journal of Educational Technology*, TOJET, Vol: 3, Issue: 2.

Uredi, I. & Uredi, L. (2005). Ilkogretim sekizinci sinif ogrencilerinin oz duzenleme stratejileri ve motivasyonel inanclarinin matematik basarisini yordama gucu. *Mersin Universitesi Egitim Fakultesi Dergisi*, Cilt: 1, Sayi:2, sf. 250-60.

Weiner, I.B. (2003). Educational Psychology. Vol. W.M. Reynolds & G.E. Miller (Eds), *Handbook of psychology*. Vol: 7.

Whang, P.A. & G.R., Hancock (1994). Motivation and mathematics achievement: comparisons between Asian American and Non-Asian students. *Contemporary Educational Psychology*, 19, pp. 302-22.

Yeap, B.H. (1998). Metacognition in mathematical problem solving. *Paper presented in Australian Association For Research in Education 1998 Annual Conference*, Adelaide.

Yuksel, G. (2003). Ilkogretim ogrencilerinin gelism alanlari, gelism alanlarinin isaretci olan ihtiyaclar ve gelistirilmesi gereken beceriler: Bu surecte rehber ogretmenin islevleri: Kurumsal bir inceleme. *Milli Egitim Dergisi*, Sayi: 159.

Zimmerman, B.J. (2000). Attaining self regulation: A social cognitive perspective. In M. Boekaerts, P.R. Pintrich, M. Zeidner (Eds.), *Handbook of self regulation* (pp. 13-39). California: Academic Press.