

The Relationship between learning style, self-efficacy beliefs, and academic fields in high school students

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Abstract

The main purpose of this study was to investigate the relationship between learning styles, self-efficacy beliefs and academic fields in high school students. In this research, we have been seeking to find whether there is significant relationship between the element of study field and learning style, between the elements of self-efficacy belief and field of study, and the elements of gender and self-efficacy. Self-efficacy consists of the beliefs a person has toward his abilities in order to organize the phenomenon to reach his desired state with suitable behavior and act (Mortazavi, 2005).

Studies indicated that the amount of self-efficacy beliefs is differing based on the people's age and gender. And self-efficacy belief increases with the increase in age in both genders and it is higher in men (Tuckman, and others 1987). Learning styles refer to beliefs and behaviors that people use to help them in learning in a specific situation (Hohen, 1999). The studies about learning styles have indicated that the various learning styles differ with gender, academic field and education

level (Philibin and others 1995), (Hicksoen and Baltimore 1996). (Hhsseini Largani 1998), (Miransari 1999).

The sample group in this study includes 399 female and male students that were selected from students of Boldaji schools in 2004-2005 academic year.

In order to evaluate learning methods we administered Cob's learning style inventory (1985) and to evaluate self-efficacy beliefs, Bandore's self-efficacy beliefs inventory were used.

The result indicates that the students of mathematics-physics field have the divergent learning style, the students of empirical sciences field have assimilate learning style, and students of human sciences field have accommodate learning style. The students of mathmatics-physics field have the highest self-efficacy compared to others. Significance was not seen between learning methods and self-efficacy belief and female students are in a higher level compared to male students in self-efficacy beliefs.

In order to increase self-efficacy we suggest the use of a successful student model, verbal persuasion, and mastery experiences and the providing of suitable conditions for gaining successful experience.

Key words: Learning style, Self-efficacy, Academic fields, High School Students

Introduction

Learning is one of the most important backgrounds in psychology today and at the meantime one of the most difficult concepts to describe (Hergenhan & Elson, Translated to Persian by Seyf, 1995). A learner who enters the learning environment possesses a set of characteristics that are his prerequisites for learning. These characteristics are called his input behaviors. These characteristics have both a cognitive aspect as well as an emotional and psycho-motor aspect (Seyf, 2000). Emotional characteristics

show the motivation for learning or interest for the lesson. Characteristics such as self-concept, self-confidence, preservation, precision, and self-efficacy belief can be considered as emotional input behaviors. One of the influential elements on one's mental quality and his emotional characteristics is how he judges himself and his efficiency level. The concept that is titled self-efficacy in Bandura's theory refers to feeling of competency, sufficiency, and capability to deal with life. The fulfillment and keeping of the functionality standards, will increase the level of self-efficacy and the inability to fulfill and keep the standards will reduce it (Bandura, 1995). Persons who possess higher self-efficacy belief show more effort and resistance for completing tasks and therefore have better and more effective task-fulfillment compared with individuals who have weak self-efficacy (Bandura1, 1993)

According to Bandura's theory, self-efficacy belief is under the influence of the following elements:

- Personal experience which leads to success or failure (experience of control over matters). This item is the important element in shaping the self-efficacy belief.
- Observing the behavior of the model, the substitute, or the example
- Vocal encouragement (Opinion suggestion or encouragement of others).
- Considering the physiological conditions (Mortazavi, 2004).

Researches have shown that the way with which a person looks upon himself is influential on his success or failure. As well, the functionality and the way with which a person persists with and shows effort is different in persons who find themselves able, efficient, and talented as opposed to weak and without talent.

Tuckman² and Saxton³, (1991-1992), Schunk, (1991) narrated by Pajares⁴ (1994). Walston¹ et. al. (1987), believe that self-

1. Banduar, A.

2. Tuckman, B.W

3. Saxton, T.Y

4 Pajares, F

efficacy belief is different in people based on their age and gender. Self efficacy beliefs increase in both genders as age increases; it reaches its maximum in middle age and is reduced after the age of 60. They believe that men are in possession of higher self-efficacy belief compared to women. Also the findings by Pajares and Miller² (1997) as well as Pajares, et. al. (1996) have shown that the boys' level of self-efficacy belief is more than the girls'. This is while the findings by Mortazavi (2004), Ahmadian (2005), and Amirian (2005) indicate that the level of self-efficacy that the girls have is more than that of the boys.

As well, the findings by Ahmadian (2005), Kandari (2002), Karim-zadeh (2001), Hekmati-Nejad (2001), Najafi (2001), Keramati (2001), Schunk (1997) and Berry³ (1994) have shown that the self-efficacy belief is higher in students of the field of mathematics-physics compared with students in other educational fields. Schwarzer⁴ and Scholz⁵'s (2002) researches have shown that in the field of mathematics-physics the self-efficacy belief is more in the boys whereas in vocal arts, it is the girls who possess more self-efficacy belief.

Among other elements that the person brings with him to the learning circumstance are learning styles. Although all human-beings have the ability to learn, however, the level and style of learning among individuals is different, even in equal circumstances. Learning styles have different formats and can be categorized into three groups: cognitive styles, emotional styles, and physiologic styles.

Kalb and Fry (1985) have introduced two dimensions and four styles of learning. The first dimension includes the objective experimental learning style versus abstract conceptualization. The second dimension learning style includes active experimenting versus deep observation. From the two by two combinations of the learning styles four learning styles are produced:

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1. Walston, N.J
 2. Miller, M.D
 3. Berry, J.M
 4. Schwarzer, R.
 5. Scholz, V.

1. Convertive learning style: This style is shaped from the two learning styles of abstract conceptualization and active experimenting. Individuals who take advantage of this style have high ability in practical applying of theories and thoughts for problem solving; they take advantage of deductive reasoning and are uninterested in social relationships. This group prefer job activities that involve tools instead of people. (Green¹, Snell², Parimmanath³, 1990); this group has a specific orientation and possesses fine performance in specialized fields such as engineering and designing (Merritt⁴ and Marshall⁵, 1984).

2. Divertive learning style: This style is a combination of objective experimental learning style and considering observation style. Individuals who take advantage of this style are philanthropic persons who are more interested in artistic and cultural fields, whose creative and innovative ability is high. (Merritt and Marshall, 1984).

3. Observing learning style: This is formed from the combination of abstract thinking learning style and deep observation. Persons who take advantage of this style are interested in abstract concepts and utilize deductive reasoning and making theory construct; they are capable of understanding high volumes of information and preparing it in a structured framework (Merritt and Marshall, 1984).

4. Adjusting learning style: This style is a combination of objective experiment learning style and active experimenting. Persons who take advantage of this style have the tendency to get involved in applied activities and experience the new and the challenging; this group welcomes dangers and is capable of meeting the special environment's demands and adopts to the new conditions (Merritt and Marshall, 1984).

1. Green, D.W

2. Snell, J.C

3. Parimanath, A.R

4. Merritt, S.L

5. Marshall, J.C

The results of the conducted researches about learning styles show that the various learning styles are related to the gender, education level, and education major. The main purpose of this research is identifying the relationship of learning styles with self-efficacy belief and the education major among the high school students. Based on this main goal, the following hypothesis have been prepared.

1. The students of the field of mathematics-physics mostly use the divertive learning style and the students of the field of human sciences mostly use the adjusting learning style.
2. The students of the mathematics-physics field possess more self-efficacy belief compared to students in other educational fields.
3. The students who take advantage of the divertive learning style are in possession of higher self-efficacy compared with other students
4. Female students have more self-efficacy belief in comparison with the male students.

Research Method

*** The statistical population and the sample group**

The statistical population under investigation included all high school students in the education system in the region of Boldaji in the school year 2005-2006. The statistical population was consisted of 5150 students. The sample group was selected from the high school students of the mentioned region by the cluster random sampling method. In this sampling, the volume of genders and education fields was put to consideration. At the end, 203 male and 196 female students were put in the sample group.

* Research Tools

In order to assess the learning styles, the questionnaire for learning styles, by Kalb (1985) is used.

In order to assess the self-efficacy belief, Bandura's self-efficacy belief questionnaire (1995) was used. This questionnaire consists of 42 items which assess the self-efficacy belief in six fields.

Data Analysis and Results

A total of 399 students participated in this research. From this group the boys had a population of 203 persons (51.9) and the girls has a population of 196 persons (49.1). From the total number, 42 persons were in mathematics-physics field (10.6 percent), 93 persons were in the experimental sciences field (23.6 percent), 145 persons were in human sciences field (36.6 percent), and 119 persons were those who studied in the first year, without any specific field (30.2 percent). 73 of the total number (18.3 percent) of students used the divertive learning style, 46 persons (11.53 percent) used the convertive learning style, 116 students (29.07 percent) used the absorbing learning style and 146 students (41.10 percent) used the adjusting learning style.

Discussion and Conclusion

The first hypothesis was confirmed in this research, which stated that the students of the mathematics-physics field mostly use the divertive learning style and that the students of the human-sciences field mostly use the adjusting learning style. This was assessed with two-way K^2 and the results confirmed our hypothesis ($K^2 = 208.148$ in the level of $\text{Alpha}=0.00$). The findings of this research are similar to the findings by Hosseini-Largani (1998), Mir-Ansari (1999), Rezayi (1999), Rahmani-Shams (1999), Witkin¹, et. al. (1977) and Anderson² (1986). As was indicated, the students of the

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1. Witkin, H.A
 2. Anderson, E.L

experimental sciences field mostly use the absorbing learning style. These research results indicate that the human sciences field students mostly use the adjusting learning style. Also the students of the field of mathematics-physics use the divertive learning style. According to the theory by Kalb, persons who use the divertive learning style have the most ability in seeing objective opportunities from various angles and have high levels of creativity and innovation.

The second hypothesis of this research was that the mathematics-physics students have higher self-efficacy belief compared to students of other fields. This hypothesis was assessed by a one-way analysis of variance. The results have shown that $F = 3.125$ is statistically significant in a level of $\text{Alpha} = 0.026$. For this reason, the research hypothesis was confirmed. The findings of this research are similar to the findings by Mortazavi (2004), Ahmadian (2005), Karim-Zadeh (2001), Kandari (2002), Hekmati-Nejad (1380), Najafi (2001), Keramati (2001), Beri (1994), Schunk (1997). Regarding the reason for the high self-efficacy belief scores in students of the field of mathematics-physics, it can be said that it is due to the more-than-enough attention given to this field by the society, teachers, parents, and those who are around and somehow related, and consequently to the field's related occupation branches such as technical-engineering branches, and the suitable income and last but not least, respect in the society through vocal encouragement which is one of the shaping forms of self-efficacy.

The third hypothesis in the research said that the students using the divertive learning style will earn higher self-efficacy belief scores. This hypothesis was investigated with the one-way statistical variation analysis test. The concluding results have shown that with $F = 2.324$ in the level of $\text{Alpha} = 0.074$, the difference is not significant between the learning styles regarding the self-efficacy belief. It seems that other variables other than learning styles are influential on individuals' self-efficacy beliefs, such as individual and character differences, cultural differences, and existing varieties in the education system.

The fourth research hypothesis states that the level of female students' self-efficacy belief is more than that of the male students. In order to investigate this hypothesis, statistical independent t-test was used. The concluded results of this test showed that with $t=2.198$ in the level of $\text{Alpha}=0.029$ the difference between girls and boys is significant in self-efficacy belief. These research findings are not similar to the findings by Pajares and Miller (1997) and Pajares, et. al. (1996), in which the boys self-efficacy belief was considered more. However, the research findings are similar to the findings by Mortazavi (2004), Ahmadian (2005), and Amirian (2005). To interpret these results, it can be said that the boys, who are the main income provider after marriage in the society have lesser motivation for education. This is since our sample was consisted of high school boys and girls and the existing conditions in the society today, and the problems with future occupation after the completion of education at university level. In the best case scenario, if they are able to pass the three entrance examinations and enter university, after completion of their education, they will not have a guaranteed occupational future. Also their self-efficacy belief is reduced by looking at all the university graduates looking for a job, who don't find a suitable job but very rarely. This lack of motivation and reduction in self-efficacy belief has caused the boys to pass the university entrance exam less than the girls. Due to the experience of control over matters, this element on its own has been influential on the boys' self-efficacy belief.

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