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Self-directing skills, metacognitive beliefs, learning styles and exam anxiety in state high school students

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Abstract

The aim of the current study was to investigate the relationship between self-directed skills, Meta cognitive beliefs and learning styles with exam anxiety. The present study is qualitative and co relational study and from goal view was fundamental study. Statistical studies population was consist of all state high school Bojnourd student in academic year of 93-94. 331 participants have been selected through Kerjeci and Morgan formula and by employing multistage cluster sampling. Self-directed skills, Meta cognitive beliefs, learning styles questionnaire with exam anxiety scale were employed for the assessment of the variables. Statistical Finding by using structural educational modeling and confirmatory factor analysis reveals that only three relations (effect) among all effect of the model were significant. Self-directedness had direct and positive effect on learning styles. Meta cognitive beliefs had direct and negative effect on exam anxiety. Also learning styles had direct negative effect on exam anxiety. Increasing self-directed skills leads to increasing the quality of Meta cognitive beliefs. However, as different factors were affecting exam anxiety self-directed skills cannot have significant influence on exam anxiety of students. Although Meta cognitive beliefs had direct significant influence on exam anxiety of students but by mediation of learning style this relationship turns to be no significant. Because Meta cognitive beliefs by mediation of learning style cannot prevent forgetting format students learning and destroying students function on exam context.

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1. Introduction

Recent studies (Antony, Craske & Barlow, 2006; Antony & Swinson, 2008) have shown that people may face a variety of disorders in their personal and social life. The most common mental illness is anxiety disorder; anxious person may resort to protest behaviorthat cannot be attributed to a specific risk which pushes into a continuous attack mode of anxiety. Anxiety is a warning sign, the news of the imminent danger that the person is preparing to confront threats (Hope, Heimberg, Juster & Turk, 2004).People of all ages can experience anxiety differently and one of these is test anxiety which is involved students during the end of year evaluation. Test anxietycan also be labeled as situational anxiety and students with high levels oftest anxietytend to have reactions based onthreat (Smith, 1990).Learning styles is one of the great strategies for improving learning efficiency which is related to the learners' motivation and information-processing habits and as a main factor in affecting learning. Due to the researchers, learning styles have different definitions and classifications which emphasis on individual learning. It may be defined as "any method which needs for better understanding rather than intelligence", mead to the internal and external variations in sequences of students individual learning and involve in processing vast amounts of information. There are multiplicity definitions and classifications for different learning styles, but in this study just Kolb's classification introduced which is the best conceived as a learning process (Rafati, 2013). One of the most popular learning style inventories is the Kolb Learning Style Inventory (Kolb, 1984). Although different results are published on its effectiveness measures, but overall studies indicate the consistency between the scale and theories of learning. Kolb's experiential learning (Kolb, 1984) theory works on cycle of learning which described the four stages in the cycle of experiential learning as: concrete experience, reflective Observation, abstract Conceptualization and active experimentation.Kolb (1999) found that people do not participate equally in the learning cycle. He pointed out that the students affected by heredity, culture, experiences, jobs and real-life situations with regard to excellence in learning. Kolb's learning theory sets out four distinct learning styles, which are based on a four-stage learning cycle. Kolb presented as lines of axis, each with 'conflicting' modes at either end.An individual may exhibit a preference for one of the four styles (Accommodating, Converging, Diverging and assimilating) depending on their approach to learning via the Experiential Learning Theory Model. Sternberg's theory of mental self-government has postulated 13 thinking styles included 5 separate interactive categories function, scope, form, plus levels and leanings (Emamipour & Saif, 2001).Functions of governments of the mind are: Legislative style: Creating, planning, imagining, and formulating. Executive style: Implementing and doing. Judicial style: Judging, evaluating, and comparing. Leaning of governments of the mind are: Individual thinking styles: new experiences, absolute opposition to customs, Conservative thinking style: ability to do accurately in predetermined ways.

One of the important factors associated with learning is metacognitive beliefs (Kramarski & Mevarech, 2003). More precisely, it refers to the processes used to plan, monitor, and assess one's understanding and performance. Metacognition affects student's learning motivation because it directly affects Self- management and Self-regulate. Metacognition can be loosely defined as thinking about one's own thinking. More specifically, metacognition is an appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the ability to make correct inferences about how to apply one's strategic knowledge to a particular situation and to do so efficiently and reliably". It can be helpful to achieve objectives such as the comprehension and memorization outcomes.The goals ofcognitive therapy mention individuals achieve self-control and self-study in order to help students become autonomous learners in terms of cognitive processes and learning which guide, supervise and reform their goals. Many of the problems of learning and learning transfer are due to the lack of metacognitive skills which are adapted to one's choice, control, monitoring, managing and improving the cognitive functions (Vøllestad, Sivertsen & Nielsen, 2011).

Therefore, students are trained in skills such as systems, self- monitoring, planning and goal setting to get well- understanding the cognitive processes involved with probability decision making. In this situation it is possible to create new types of learning; otherwise it is difficult to do the tasks that have not been previously encountered. There is difference between cognition and metacognition. Cognitive training needs methods to handle tasks whereas Metacognitive training emphasizes on techniques for monitoring, evaluation and how to use cognitive strategies (Beck, Emery & Greenberg, 2005).

Self-directed learning is another disorder closely related to the anxiety. Because of today's rapid changes we require to use of new methods and practices, especially in the field of teaching, learning and SDL as effective ways which help students' achievement, satisfaction and successes. A review of the research literature shows that Self-directed learning represents a major paradigm shift in thinking about the responsibility and independence. This is a factor in which individuals take the initiative, with or without the assistance from others. Self-directed learning as a theory move along a common self-actualizing (Fournier, Kop & Sitlia, 2011). Based on Researches (Friesen, 2010) student's perspective on the value of self-directed learning. The results of several studies (Fischer, Giaccardi, Eden, Sugimoto & Ye, 2005; Fournier & Kop, 2010; Fournier, Kop & Sitlia,2011) demonstrate self-directed learning impacts students' success in school and in life. Comprehensive research is essential to discover relationships between some educational variables in Iran. Thus "the research question is specified below:": what is the relationship among self-directed skills, metacognitive beliefs and learning styles on test anxiety in public high school students of Bojnourd?

2. Method

The present study was based on descriptive survey carried out by solidarity and the goal was as a basic research.

2.1. Participants

The population of 331 students who were selected by randomly cluster sampling from public High schools of Bojnourd. According to the received responses, results were as follows: 16 White questionnaires, 30 questionnaires were flawed or there were more than 10 unanswered questions. Also, before analyzing the data, the remote data identified and removed and the number of cases fell from 285 cases to 250 cases. In total, data were collected from 250 students in the final analysis.

2.2. Measurement

2.2.1. Test anxiety questionnaire

Sarason test anxiety questionnaire (1980) was used to measure test anxiety. The questionnaires by Sarason, Davidson, Lighthall and Waite (1958) and has been revised in 1980. Test-retest reliability coefficients of anxiety within a few weeks, more than 80 percent (Hall & Ponton, 2005).

Antony, Craske and Barlow (2006)reported reliability coefficients for test anxiety scale, 87 percent. Test Anxiety Scale (TAS) included 37 items. Our Standard and Qualified grading scales for test anxiety score consisted of the number of questions students answered correctly. The reliability of the questionnaire Cronbach's alpha to measure test anxiety has been reported 0.89.

2.2.2. Learning Style Inventory

Kolb's Learning Style Inventory (KLSI) (1984) was an instrument used to measure learning styles consisted of four-type definition of learning styles and in each section, higher scores indicated greater perception of students' learning ability. Each question should have a single correct answer that students would be able to match with their learning styles and got 4 points for the best answer. Questionnaires measurements were organized in total score range respectively 1, 2, 3, and 4. Different parts of the test included: concrete experience, reflective observation and abstract conceptualization. The validity of this test has been reported by Wilcoxon and Prosser 0.87.

2.2.3. Metacognitions Questionnaire

Metacognitions Questionnaire –MCQ- (Wells & Cartwright-Hatton, 2004). MCQ was a questionnaire with 30 items divided into five groups

of factors that assessed some dimensions of metacognition. Factors are named: Positive beliefs about worry; Negative beliefs about worry concerning uncontrollability and danger; Cognitive confidence; Beliefs about need to control thoughts; and Cognitive self-consciousness. Range of Cronbach's alpha coefficients and its components have reported 0.72 to 0.93. Abolghasemi, Golpour, Narimani and Ghamari (2007) reported Cronbach's alpha coefficient of the questionnaire 0.81. In the questionnaire, the respondents were asked to carefully read the options and mark each option with a best individual sense.

2.2.4. Self-directed questionnaire

Self-directed questionnaire contained 40 items that respondents answered 5 on a scale of 1-5 ranging; 1, strongly agree to 5, no idea. The first original version consisted of 52 items but due to an overview of basic psychometric and standardized principles 12 items removed in the Persian version. Principles of questionnaire were based on both the positive and negative skills. This questionnaire was first translated to Persian by Nadi, Gordanshekan, and Golparvar (2011) and its content validity has been confirmed. Upon their approval, Cronbach's alpha coefficient was 0.82. Cronbach's alpha coefficient, respectively, self-management: 0.78, willingness to learn, 0.71, self-control: 0.60 and self-administration of the questionnaire 0.82 respectively.

3. Results

Descriptive findings showed that reliability coefficients (Cronbach's alpha) for all variables, except the willingness to learn and self-awareness, were in the acceptable range (0.60 for the management of) to fit (0.86 to learning styles). The Cronbach's alpha coefficients for the whole questionnaire metacognition were 0.84 and 0.82 for self-direction skills. In addition, the correlation between the observed variables showed that among skills of self-directed, only the management of test anxiety indicated a significant negative correlation and among learning styles, only style of abstract conceptualization indicated a significant negative correlation. However, there were a significant negative correlation between test anxiety and all aspects of metacognition.

Table1. Measure of conceptual model in research proposals between estimated parameters

Latent	Observed	Load factor	*leftover*	T value	CRI
Self-directed skills	Self-control	0.84*	0.29	----	0.77
	Self-management	0.86*	0.55	8.23	
	Willingness to learn	0.66*	0.56	8.38	
Metacognitionbeliefs	Positive beliefs about worry	0.55*	0.70	----	0.68
	Uncontrollability and danger	0.70*	0.51	6.89	
	need to control thoughts	0.66*	0.56	6.81	
	Self-awareness	0.12	0.99	1.66	
	Cognitive trust	0.65*	0.58	6.78	
Learning styles	Active experimentation	0.70*	0.51	----	0.84
	Reflective observation	0.80*	0.36	10.32	
	concept of the abstract	0.82*	0.33	10.44	
	Concrete experience	0.67*	0.55	6.57	

Note: Maximum-likelihood estimation (MLE) (*P<0.01)

As Table 1 shows that all variables observed in the study, indicated Significant loading factors on latent variables with the exception of self – cognitive. Also, the results of the evaluation showed the reliability of combining latent factor with latent variable coefficients in the range of 0.68 for metacognition of 0.84 for the learning styles. These results showed that the reliability of a measurement can be classified as acceptable levels of reliability to fit reliability. Assessment of composite reliability index is the same Cronbach's alpha coefficients. And generally "high" values for it imply the reliability of

the scale. Since the variables of cognitive self-consciousness factor loadings on latent variable of metacognitive measures had non-significant correlations, this variable was removed from the aspects of metacognition so the reliability of combining latent factor increased from 0.68 to 0.74.

Table2. Goodness-of-fit Indexes for research model

Fit indices	χ^2	P	df	χ^2/ df	GFI	AGFI	NFI	TLI	CFI	RMSEA	RMR
Model	82.32	0.002	49	1.68	0.95	0.92	0.91	0.95	0.96	0.052	0.079

Results were not statisticallysignificant on chi-square test for goodness of fit and store the results of the fit for outcome data analyses. This kind of measurement is weak, unstable and sensitive to the sample size (values of chi-square increase as an effective chance to make significantly enhance) and the number of parameters. Due to the high sensitivity of chi-square, measured with their respective indicators, were relatively weak. Because of such limitations should refer to other indices.

Table3. Measured parameters of the model of research

Latent	Observed	Load factor	leftover	T value	CRI
Self-directed skills	Self-control	0.84*	0.29	**----**	0.77
	Self-management	0.86*	0.54	8.28	
	Willingness to learn	0.66*	0.56	8.38	
Metacognitionbeliefs	Positive beliefs about worry	0.54*	0.71	**----**	0.74
	Uncontrollability and danger	0.73*	0.47	7.02	
	need to control thoughts	0.61*	0.63	6.53	
	Cognitive trust	0.66*	0.56	6.75	
Learning styles	Active experimentation	0.69*	0.52	**----**	0.83
	Reflective observation	0.80*	0.36	10.32	
	concept of the abstract	0.82*	0.33	10.44	
	Concrete experience	0.67*	0.55	9.01	

Note: Maximum-likelihood *estimation (*MLE*) (*P<0.01)*

Table 3 shows that all markers or variables observed in all latent variables are the significance of factor loading and combining reliability index (CRI) for all of these latent variables, is a good-fitting model. Figur2- Determining the significance of a path coefficient based on endogenous variables.

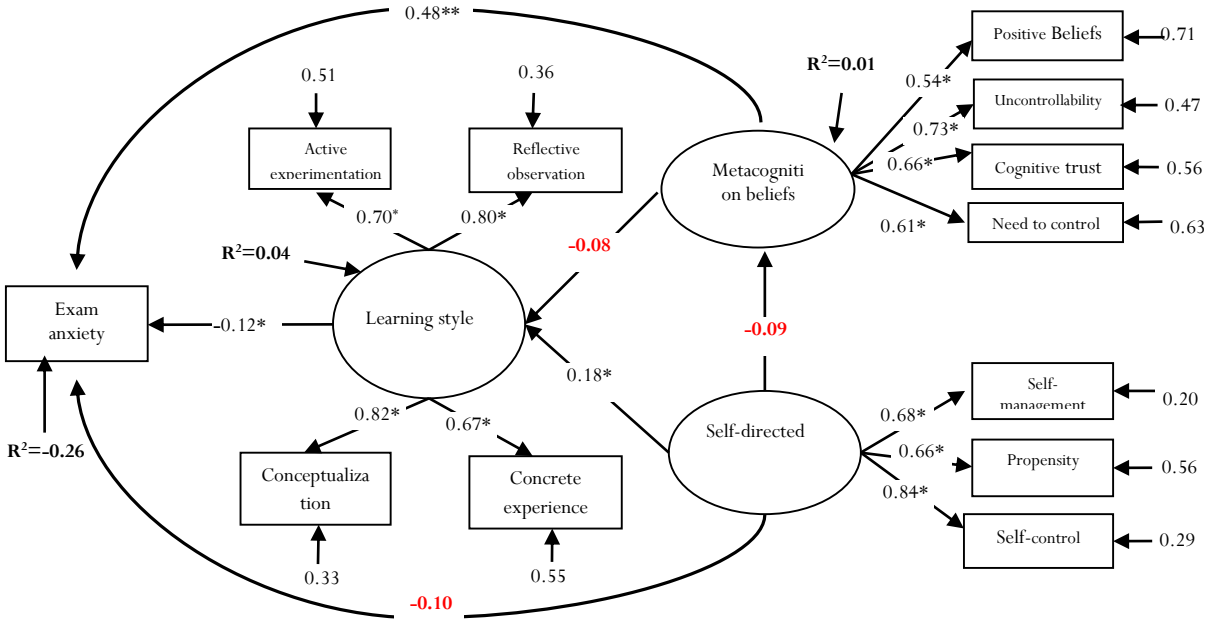
Latent variables are placed in an oval, observed variables are placed in a rectangle, arrow from an oval to a rectangle are represented load factor, bold arrows indicated significant standardized path coefficients, Arrow dotted rectangle to oval show determination coefficient of determination of an endogenous variable (the proportion of the variance explained), arrow number to rectangle are represented error or residual values of observed variables.

Table4. The final Correlation between latent variables and the dependent variable

Variables	Self-directed skills	Learning styles	Metacognitionbeliefs	Test anxiety
Self-directed skills	1			

Learning styles	0.16**	1		
Metacognitionbeliefs	-0.090	-0.06	1	
Test anxiety	-0.11	-0.14*	-0.44**	1

**P<0.01; *P<0.05



Maximum-likelihood *estimation* (MLE) *(*P<0.01; *P<0.05)*

Figure2. Final standardized and significance path coefficient, based on endogenous variables

Table5. Direct effects

line	Not St. coefficients	St. coefficients	The standard error of the estimate	T	Sig.
Self-directed **to***metacognition*	-0.025	-0.091	0.023	-1.098	0.272
Self-directed **to***learning*	0.067	0.183	0.029	2.320	0.020
Metacognition **on***learning*	-0.111	-0.084	0.106	-1.047	0.295
Metacognition-**on***test anxiety*	0.266	0.470	0.048	5.506	0.001
Self-directed **to***test anxiety*	-0.016	-0.102	0.010	-1.531	0.126
Learning **to***test anxiety*	-0.052	-0.121	0.026	-1.98	0.047

St.= **standardized**

The results presented in figure 2 and table 5 showthat only three lines among all lines of model are significant. A significant level of self-directed was 0.50, have direct and positive effect on learning styles. This means that with growth of self-directed, occur learning styles promotion.A significant level of metacognition was 0.10, have direct and positive effect on exam anxiety. This means that this means that by increasing the scores of high school students in these beliefs, their anxiety increases. Finally, these results show that significant learning styles of 0.05has direct and negative effect on test anxiety.This means that by improving the learning styles of high school students, test anxiety is reduced. Also, the results presented in figure 1 shows that exogenous variables of the model, explained 0.01 of the metacognitive variances, 0.04 percent of the variance of learning styles, And 0.26

are of variance test anxiety. Lack of significant of three direct pathways and Low coefficient of determination in endogenous variables of the model indicate models as examples of poor structural model fit.

Table6. Sobel test results in the significance of the indirect effect of the model

Indirect lines	Effect size	Sobel statistic size	Significant
Skills on test anxiety through self-directed learning styles	-0.022	1.14	0.15
Metacognition on test anxiety through learning styles	0.010	1.46	0.25
Self-directed learning styles and skills of metacognition	0.008	0.89	0.37

Above shows that Sobel test results in the significance of theindirect effect, there isn't any level of significant in the indirect lines.

4. Conclusion

According to Williamson (2007) there is no significant effect between self-directed skills and students' learning style. So learners are active and focus more on spontaneous activities. Instead of apassiveflow of learning and outcomes included an expectation that can be improved students' self-directed learning initiatives. That is certainly true, "teacher-centeredinstruction" use in most classesand students walk in opposite direction so students just can't seem to followthe rules. In many cases, students do not want or find it moredifficult to understand learning styles. According to Pilling-Cormickand Bulik (2000) with regardto the norms and principles ofnon-alignment to the present study, there is a significant relationship between SDL and education successful. According to the Pilling-Cormick and Kops (2000) test anxiety wasnot significantlyeffective on students'learning styles because severe anxiety is conducted to the turbulence and collapsed behavior organization, hardly to say that people with chronic anxiety leads to the flexibility reduction and manifests witha wide range of anxiety disorders. Whitebread et al., (2009) findings as the study of the relationship between test anxiety and academic performance of students with regard to the norms and principles of non-alignment to the present study has shown that there are significant differences in the prevalence of anxiety. Also in present research there is no significant relationship among test, anxiety and academic performance which is regarded to the norms and principles of non-alignment the present study.

In explaining the theory, we can say that self-directed skills wereinversely correlated with test anxiety, thus whatever students are involved in the developmentof a self-directed learning, and they are more likely to overcomingtest anxiety.

These findings contrast with the findingsby Pilling-Cormick and Kops (2000) findings and causes of resultvariation are related to the self-directed in learning style and its right training programs. For learning may be, not choosing and implementing appropriate self-directed strategies. Perhaps lack of a mismatch in these findings is due to the choice ofsmall sample sizes sothe resultscannot be easily generalizedas representative of the community.

According to theSchraw, Crippen and Hartley (2006) findings because of the metacognition beliefs as a mediator of the effectoftest anxiety whereashigh-test-anxious persons routinely causedpoor performance (preventive cognitive task) and tend to belessable tothink (facilitating cognitive task).Palinscar & Brown (1984)reported the resultsthat cognitiveskillstraining improve both learning and learning transfer. Schneider (2008) Believes that Metacognitive skills have a positive effect on enhancing learning outcomes and finally beingmore self-sufficient. So learners withgreater metacognitive abilities tend to be more successful in theirproblem-solving.

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