The Effect of Interactive Teaching Style Based on Self- Efficacy among Female Students of Isfahan High School in Mathematics

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Abstract
The aim of the present study was analyzing the effects of interactive learning style on the self- efficiency of the students of Isfahan city girls' high school in mathematics 1 year 2013-2014. Accordingly, regarding the aim, the study was applied and the method of the study was quasi- experimental. The population of the study was all of the students of the high schools in Isfahan who were studying in the year 2013. Data collection instrument was the standard self-efficiency questionnaire of Scherer et al. which includes thirty items and five factors of self-efficiency including insight, concentrating on the purpose, mediating on the purpose, problem-solving, and self-evaluation. In order to determine the face and content validity of the questionnaire, the Delphi method was used. Using Cronbach's alpha coefficient, the reliability of the instrument was measured as %82 that indicated that the measurement instrument had a suitable reliability. After collecting the data, they were analyzed through covariant, Levin's test and SPSS software. The results indicated that in the posttest stage, there is difference between the experimental group and control group at the level of alpha $p < 0.01$. This shows that interactive style has positive effects on the concentrating on the purpose, mediating on the purpose, problem-solving skill, and the amount of self-evaluation factors but no effect was observed on the factor of insight.
Keywords: Self-efficiency, Interactive learning, Students.

Introduction
The Impact of behavioral sciences on communities is far greater than most people think. On the one hand, they provide technical solutions for important human issues and on the

other and on a deeper level, change the concept of human nature, meaning our fundamental beliefs about wishes and human resources. It is evident that, when such notions and concepts change, for it will change society. Most of our ideas about many diverse subjects have changed which was caused by the inquisitor minds of many pioneers and commentators and their scientific and theoretical facts and achievements which were done in order to make phenomenas intelligible. One of the subjects of interest to education instructors is identifying variables having an impact on the engagement level of students in school tasks and leads them to have different academic performance. In this regard, variables like self-efficiency or self-efficacy (Leinnbernik & Pishrich, 2003) was identified and emphasized as a mediator variable and regulator of academic behavior. Self-efficiency is one of the important constructs in the education system which includes sub-components like focus on goal, contemplation on goal, intrinsic motivation, problem solving and self-evaluation (Sherer et al., Rashdi, 2012). In Bendura's opinion, the second important aspect of the "Self" or "ego" is the concept of self-efficiency. In 1977, he brought this construct to the literature of psychology and defined it as the perceived individual's ability in adapting with certain situations.(Pajarrs, 2002). According to Bendura's definition, self-efficiency is defined as the individual's conviction, meaning that he can successfully do the correct required behavior, in order to successfully achieve the desired outcome. He believes that self-efficiency is dependent on a certain situation and have a significant correlation with the situation an individual faces.(Chari, H.,2008). In this respect, many researches demonstrated that the structure of class, interaction method, psychological atmosphere of the classroom and most importantly, educational (teaching) strategies provide different experience situations and can have an important role on establishing self-efficiency in learners. (Wijsman, 2010; Poton, 2001; Schunk, Haddoune & Algeria, 2012). Since, instructional strategies represent the style and manner of the teacher's educational duty performance, is very influential in the class structure. Concrete examples of these strategies is depicted in class management method and presenting content and most importantly, the reaction of learners, based on these, we can define interactive education as an education in which triple activities of cognition, emotional and metacognition are done with the help of teacher and student. Although, in this style of teaching, organization of the educational environment is the teacher's responsibility, but he does not enforce his opinion on the students. (Shabani, 2010). In this respect, an investigation under the name of The effect of self-reported educational methods on general self-worth and self-efficiency of female students, was conducted by Akbari et al. (2011) in Azad University Anzali Branch. Results showed that problem solving methods, resolving conflicts and practical decision making have a certain and significant effect on students' general self-efficiency and self-value/self-worth. Also, in another research under the name of Investigating the effect of metacognition teachings on students' self-efficiency was conducted by Rashidi (2012) among third year female students of human sciences in Hamedan. Results showed that metacognition skills leaded to an increase in students' self-efficiency. In Beichner & Ann's (2011) research, under the name of The relationship between teacher's multi- intelligence educational practices and students' educational self-efficiency, results showed that students' whose teacher used 2 intelligence out of 3 multiple intelligence strategies, had a higher self-efficiency than the other group whose teacher used one strategy. According to the raised issues and considering it is expected that education train efficient learners who believe in their abilities and take learning responsibility throughout their lives and since, the most

important tool of educational systems to achieve this, is the educational content and methods, so the fundamental question of this research is whether interactive education styles have any impact on students' self-efficiency level.

Materials and Methods
Statistical Population and Research Sampling
The population in this study consists of all the first-grade students from the six districts of the Isfahan city in the school year of 2013-2014 studying in girl's high school in Isfahan and their total number is equal to 13276.

Sampling Method and Statistical Sample
Sampling method in this study is convenience sampling. The sample size in this study is 60 participants. To select the sample, first Isfahan city was chosen, and then the fourth educational district and of this district a school was selected and of this school, two classes were picked as statistical sample.

Method of Research
After statistical sample selection, To conduct this research, first we took self-efficiency test from all the pre-test students, then sample was randomly divided into two groups, The control group and The experimental group and The experimental group was subjected to interactive education for three one hour sessions per week for the total of 20 sessions. Upon completion of training, both groups took the post-test.
To analyze the data from descriptive-statistical indexes, including variance, mean, standard deviation, Levene's test tables and inferential statistical tests and Analysis of Covariance were used.

The Data Collection Tool
The data collection tool in this study is the Sherer et al. Standard questionnaire of self-efficiency assessment, which consists of 30 items and evaluates 5 self-efficiency components including, intrinsic motivation (4 items), focus on goal (4 items), contemplation on goal (5 items), problem solving (5 items) self-evaluation (6 items). It is based on a five point rating scale. This questionnaire has 5 neutral questions. In this questionnaire, questions number 1-9 are neutral. Scores of the questions number 3-5-6-7-8-11-12-14-18-20-22-24-26-29-30 are reversed thus, "Disagree" option has 5 points, "Partly Disagree" option has 4 points, "No comment" option has 3 points, "Agree" option has 2 points and "Partly Agree" option has 1 point and in questions number 4-10-13-15-16-19-21-23-27-28 , "Agree" option has 5 points, "Partly Agree" option has 4 points, , "No comment" option has 3 points, "Agree" option has 2 points and "Partly Agree" has 1 point. The total score of the participant is equal to the total score obtained from the questions (except the neutral questions). Method validation or conceptual validity was used in the present study. Because, when empirical validation is not possible, or getting credit for a measure or quantity through empirical or practical methods is difficult, conceptual validity is used and in fact the researcher seeks to show, through standards and evidence, that measuring a concept or construct is valid .(Khaki, 2002). The scholar by referring to the opinion of experts and teachers makes sure that his measuring tool in assessing the research variables is valid.

Reliability means that a test is reliable, when the observed scores and the real scores have high correlation. To assess the reliability of the tests, Cronbach's alpha was used.

Validity
Self-efficiency assessment questionnaire of Sherer et al.was standard and its validity was confirmed by scholars in different researches including Rashidi's (2012).

Reliability
The reliability of Sherer' standard questionnaire was reported by himself and his colleagues to be 0.76 .Also, in Rashidi's investigation (2011), it was reported to have a 0.81 validity. Also, to measure the validity of this questionnaire, we used Cronbach's Alpha method in this investigation and it was calculated to have a value of 0.82 and since, its value is higher than 0.7, demonstrates that the test has reliability.

Results
Demographic characteristics of the data are shown in table (1). Table (1) Demographic characteristics of the Participants

Demographic characteristics of the Participants		
Sex	Female	
Grade	High School	
Number of training sessions	20	
Number of training sessions	2014	
Field	General	
Number	control group	30 Person
	experimental group	30 Person

Table (2) describes the effect of interactive education style in the study sample. The scores of the interactive education style questionnaire which was given to the students, was in Likert spectrum in the form of scores, considered by calculating the mean in each of the participant's score dimensions in an interval scale.
Table (2) comparing central tendency and distribution indexes among interactive education style in the experimental group

Component interaction styles	Pre test			Post test		
	Mean	standard deviation	Variance	Mean	standard deviation	Variance
Focus on goal	3.19	0.66	0.44	4.09	0.56	0.318
Penetration on goal	3.17	0.52	0.27	3.46	0.70	0.495
Intrinsic motivation	3.39	0.64	0.41	3.28	0.58	0.344
Problem solving	2.63	0.64	0.42	3.82	0.60	0.370
Self evaluation	3.12	0.69	0.48	3.26	0.42	0.181

Table (2) demonstrates the difference between groups among themselves and also the difference between pre-test and post-test in the experimental group. The findings in this table show the effect of interactive education style on the students' self-efficiency, in which, the mean of students' scores after receiving interactive education style was higher than pre-test.

Table (3) demonstrates the difference between groups among themselves and also the difference between pre-test and post-test in the control group. The findings in this table shows in the effect of interactive education style on the students' self-efficiency, all the components have close mean and standard deviation in both groups of pre-test and post-test.

Table (3) comparing central tendency and distribution indexes among interactive education style in the control group

Component interaction styles	Pre test			Post test		
	Mean	standard deviation	Variance	Mean	standard deviation	Variance
Focus on goal	3.84	0.79	0.630	3.90	0.66	0.44
Penetration on goal	3.13	1.23	1.52	3.15	0.52	0.27
Intrinsic motivation	3.05	0.66	0.44	3.18	0.64	0.41
Problem solving	3.74	0.660	0.43	3.82	0.64	0.42
Self evaluation	3.35	0.68	0.47	3.27	0.69	0.48

In order to test the investigation's hypotheses, the means of difference scores of both pre-test and post-test in the experimental and the control groups were analyzed by multi-variable Analysis of Covariance (ANCOVA). As the results show in table (4), there is a significant difference in $p < 0.01$ level, between all groups in all the components, except in intrinsic motivation. It means that the difference between students' focus on goal, contemplation on goal, intrinsic motivation, problem solving skill and self evaluating, is significant in experimental and control groups. Because, the self-efficiency's components scores mean in experimental group in post-test is higher, then interactive education was able to increase self-efficiency in students.

Table (4) Analysis of Covariance of self-efficiency's sub-components

Component interaction styles	Total Square	df	Mean square	F	Sig	Eta	Statistical power
Focus on goal	1674.40	1	1674.40	3.09	0.001	0.251	0.85
Penetration on goal	1245.49	1	1245.49	1.99	0.001	0.16	0.74
Intrinsic motivation	1214.44	1	1214.44	1.24	0.26	0.29	0.71
Problem solving	1392.64	1	1392.64	3.12	0.001	0.34	0.79
Self evaluation	1383.80	1	1383.80	3.003	0.001	0.28	0.81

Discussion and Conclusion

The aim of the present study was to investigate the effect of interactive education style on the level of students' self-efficiency. Results show that interactive education style is effective on students' self-efficiency. In another word, students who were present in interactive education classes had a higher self-efficiency level than those who weren't present in these sorts of classes. Findings of the present study on the effectiveness of interactive education style on the level of students' self-efficiency is coextensive with the research findings of Arizi (2009), Shabani (2011), Akbari (2011), Escarti (2010) Beichner & Ann (2010), Kelinos (2012). Arizi, in his investigation which was conducted among the 11-14 year old school girls in Isfahan, demonstrated that teaching problem solving skills have significant and positive effect on self- efficiency and perceived self-efficiency. Akbari, also demonstrated in his investigation that problem solving learning methods, resolving conflicts and practical decision making have a certain and significant effect on students' general self-efficiency and self-value or self-worth. In this respect Rashidi's findings determined that teaching metacognition skills leaded to an increase in students' self-efficiency. Moreover, an investigation under the name of the relationship between response-based teaching pattern and students' self-efficiency in Physical education, was conducted by Escarti et al. (2010) in University of Valencia in Spain. Results demonstrated that the above mentioned teaching pattern, leaded to an increase in students' responsible learning and self-efficiency. An Investigation called the relationship between teacher's multi-intelligence educational practices and Students' educational self-efficiency was conducted by Beichner & Ann in Walden University. Findings showed that students' whose teacher used 2 intelligence out of 3 multiple intelligence strategies, showed higher self-efficiency level, than the other group whose teacher used one strategy. In explaining why interactive education style plays an important role on students' self-efficiency, we can refer to Bendura's theory. Bendura believes that educational factors and status are effective in the growth of self-efficiency and believes if we provide an opportunity in the education system, for learners to work in a participatory way and instead of being compared to others in their tasks, be judged based on their individual progress, we can help many students in their self-efficiency

growth (Bendura, 1986). Furthermore, what is causing considerable attention towards self- efficiency as an important cognitive variable is the effect it has on individuals. Individuals who have high sense of self-efficiency are mentally healthy. When facing difficult tasks instead of avoiding it, they struggle with it. They have high commitment in achieving their goals; they attribute their failure to insufficient endeavor, incomplete knowledge and skills, but believe it to be amendable. They attribute their successes to personal capabilities, when facing difficult tasks instead of feeling anxious and pressured, experience a sense of relief, have broad perspectives on problem solving methods, after failure, their undermined confidence quickly recovers, show more engagement and interest in doing their tasks, have confidence in their solutions, but at the same time are flexible. High self-efficiency decreases fear of failure, increases wish level and improves problem solving abilities and analytical thinking (Bendura, 1993). According to the results of this research, we propose the following practical suggestions: regardless of the above-mentioned, some of the limitations of the present study make it difficult to generalize the results. In the present study, to measure the study variables, Paper- and-Pencil questionnaire was used and due to the limitations of tools such as questionnaire, this study is limited in accurately assessing behavioral topics. Also, this study was conducted on the students of one district out of 6 districts of the Isfahan city. So generalization of the results to other groups should be done with caution.

Conclusion
The results of this study have indicated that interactive education style has an important role on students' self-efficiency level. The results of this study once again, puts the focus on teaching methods, meaning that there are diverse methods of teaching and teachers should acquire the necessary grasp on teaching methods, in order to choose the right method of teaching, based on the type of class, students and their learning styles status. In the process of education, teaching methods are considered working tools and by using these tools, given the time and place factors, we can provide students with learning content and material.

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