

Full Length Research Paper

The effect of collaborative learning and self-assessment on self-regulation

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Received 16 June, 2015; Accepted 21 July, 2015

In this study, the effects of teacher assistants' collaborative learning and learners' self-assessment on self-regulation and academic achievement at high levels have been investigated. Collaborative learning teaching method (Jigsaw and teacher assistant) is used for one group and the other group had also the same as well as learners' self-assessment for eight 90-min-sessions. The study population included 75 persons who are divided into three groups of 25 subjects (two experimental groups and one control group). Using a learning techniques questionnaire and the motivated strategies for learning questionnaire (MSLQ) as well as a self-developed achievement test to measure the geometry in the lower and upper levels of the cognitive domain, it was revealed that "cooperative learning and self-assessment" have a positive effect on promoting learners' "self-regulation" knowledge for geometry course. Collaborative learning and self-assessment also have a positive impact on academic achievement at low and high levels of learners' cognitive domain.

Key words: Collaborative learning, teacher assistance, self-regulation, motivational beliefs, self-efficacy, high levels of cognitive domains.

INTRODUCTION

Self-regulation is essential for learning, but it is neither innate, nor spontaneous. It is imperative for the subject to clear up the reference in order to have an effective auto-regulation. The teacher has the responsibility to create opportunities for students to construct this reference, in order to permit the appropriation of the meaning of learning objectives.

Self-regulation is a socially constructed process. Progressive work with the assessment criteria contributes to the development of self-regulation. In primary education, the establishment of strategies to pursue, which is the phase of self-regulation least achieved by students of these ages, depends mainly on the support

provided by teachers' action.

Collaborative learning requires working together toward a common goal. This collaboration is more than co-operation. Collaboration entails the whole process of learning. This may include students teaching one another, students teaching the teacher, and of course the teacher teaching the students, too. More importantly, it means that students are responsible for one another's learning as well as their own and that reaching the goal implies that students have helped each other to understand and learn.

Hence, the educational system should teach students different ways of thinking and carrying out tasks

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independently and be creative, innovative, self-efficient, and self-regulated. In the traditional or inactive model, the teacher the main task and the students have to obey him/her in order to learn. The system is quite weak in group cooperation and relations between the individuals and individual differences are disregarded, the teacher's activity is self-collaborated, teacher relies solely on the text content and implications, the teacher focuses on the repetition of the exact content by students. In short, the teacher as a database is required to convey that information to the students' minds.

LITERATURE REVIEW

Self-regulation is a self-produced set of thoughts, feelings and actions that are designed by a person and are continuously adjusted to achieve the desired objectives (Zimmerman, 1995). Pintrich and De Groot (1990) define this type of learning as an active and organized process in which learners set some learning goals for themselves and then try to regulate, control, and monitor their motivation, knowledge, and behaviors. Self-regulated learning is a concept that focuses on the role of the individuals in the learning process.

The importance of this structure in learning and achievement is to the extent that different researchers have presented different models. One of these patterns is Pintrich's (1999) model. In this model, "self-regulation in learning" refers to the efficient use of cognitive strategies and any behavior, thought, or actions aimed at helping to learn, organize and store knowledge and skills, and provide the ease of future operations (Zimmerman and Martinez-Ponz 1990). Gardner and Jewler (2000) emphasized that students in cooperative learning, rather than being mere listeners, are the scholars who actively participate in the learning process and are responsible for their own learning. Brahmar and Harmatys (2009) also showed that self-assessment can have a positive impact on increasing the motivation of students about their own learning. Slavin (1991) examined how collaborative learning helps students to give away the perception that teachers are the only source of knowledge and information. Cooper (1995) showed that collaborative learning prepare students for entering to the world of work, strengthen the spirit of cooperation. Whicker and Nunnery (1997) also showed that most students indicated that they liked working in groups and appreciated getting help from other students, especially for learning difficult concepts. Some students dislike having groups pre assigned and permanent, and they suggested alternating group membership. Feiz et al., (2013) show that MSLQ could be used to measure self regulated learning strategies employed by Iranian students.

RESEARCH METHODOLOGY

The study comprised two hypotheses: a) Do "collaborative learning and self-assessment" have an effect on promoting students' "self-

regulation" in learning geometry? b) Do "collaborative learning and self-assessment" have a positive impact on students' achievement? Regarding the purpose of this study, it is a developmental research. In terms of data collection, it is a quasi-experimental study. In this study, two experimental groups and one control group were used. Self-motivation pre-test was conducted in three levels and the academic achievement pre-test in two levels for all groups. In the first group of tests, teacher assistance cooperative learning was carried out. In the second group of tests, teacher assistance cooperative learning and self-assessment were conducted. The control group was also taught in the traditional teaching methods. The research sample consisted of 3 classrooms of one school. Sampling was the convenient one. The class as a high school group and a class of the same school as the control group were studied. In order to have a precise comparison and similar social and economic base and academic achievement for three groups, the sample selected for this study were female students studying in 11th grade of high school.

Two groups were investigated as experimental groups and one group as the control one. In this way, a sample consisting of 75 people were studied in 3 groups of 25. Experimental groups were tested in geometry for 8 sessions with collaborative learning. In this study, a part of the Pintrich and de Groot's motivated strategies for learning questionnaire (MSLQ) as well as a self-developed achievement test was used to measure the geometry in the lower and upper levels of the cognitive domain.

The MSLQ was developed using a social-cognitive view of motivation and self-regulated learning. In this model, students' motivation is directly linked to their ability to self-regulate their learning activities (where self-regulated learning is defined as being metacognitive, motivational, and behaviorally active in one's own learning processes and in achieving one's own goals (Eccles and Wigfield, 2002). This framework assumes that motivation and learning strategies are not static traits of the learner, but rather that "motivation is dynamic and contextually bound and that learning strategies can be learned and brought under the control of the student" (Duncan and McKeachie, 2005). Said another way, students' motivations change from course to course (e.g., depending on their interest in the course, efficacy for performing in the course, etc.), and their learning strategies may vary as well, depending on the nature of the course.

The self-developed achievement test consists of ten questions. Five questions measure low levels of cognitive domain and the rest are related to the measurement of the upper levels of cognitive domain. The MSLQ questionnaire contains 22 questions. It measures three different factors: self-efficacy beliefs, students' beliefs about their goals and students' beliefs about their values and interests. It consists of a five-point Likert scale. The teaching method implemented in this study was teacher assistance cooperative teaching. This method is a mixture of traditional schools method and cooperative jigsaw approach and is used in this study with some innovations. In this model, students' cooperation with each other for learning is of essence. This method has two within and outside of the school aspects. The teacher taught the subject using jigsaw teaching method for within aspect of the school and traditional method for outside aspects of the school. In this step, the students were classified into three groups (weak, moderate, and strong) based on their previous scores and the general knowledge of their teacher. Then, they were divided into groups of three including one student of each level. In the next step, to strengthen relations, the groups were asked to choose a sign and an appropriate name for their group. Following this step, each group was given a guide for group activities.

RESULTS

Data used in this study were obtained through

Table 1. The interaction between within and between groups.

Indices variable	Sum of squares	df	Mean- Squares	F	Significance level
Within the group	9680.167	1	9680.167	149.863	0
Between-group factor	12906.280	2	6453.140	92.091	0
Interaction	4145.613	2	2072.807	32.09	0

Table 2. The first hypothesis test results

Indices Variable	Groups	Significance level	
MSLQ	Traditional	cooperative	0
		self-regulation	0
	cooperative	self-regulation	0

Table 3. The second hypothesis test results.

Indices Variable	Sum of squares	df	Mean- Squares	F	Significance level
Within the group	56.734	1	56.734	12.88	0.001
Between-group factor	165.136	2	82.56	12.348	0
Interaction	1.397	2	0.699	0.159	0.854

questionnaires of self-regulation and academic achievement in geometry for subjects in the control group and experimental groups, before and after the implementing the independent variable. In this research, measures of central tendency and dispersion (mean and standard deviation) are used. In order to investigate the effect of collaborative learning on self-regulation and academic achievement, one-way ANOVA, Turkey test, and mixed ANOVA were used. In this section we examined the assumptions using analysis of variance with repeated measures.

Because participants were examined in three groups (namely traditional, cooperative, and self-regulated) before and after the test, repeated measures of the analysis of variance was used to determine the differences between the groups and the test impact on the groups. Hence, there were two variables, i.e. between groups (the group) and within groups (the test). The interaction between factors (both within and between groups) was also measured. In fact, the researcher had to determine the influence of groups on self-motivated learning strategies and academic achievement and find out the changes of self-motivated learning strategies and academic achievement in traditional, self-regulated, and cooperative groups. Finally, it was possible that the changes were not the same for different groups (Table 1).

With regard to the first hypothesis, we find out that as shown in Table 2, significant level of learning teaching method is less than .05, i.e. cooperative learning and self-assessment have made changes in the students' self-

motivation in the posttest. The significant level for interactions within and between groups is equal to zero and less than .05. That is, the effect of learning teaching method on the motivation scores of students in traditional, self-regulated, and cooperative groups is not statistically identical. The significant level for interactions between groups is equal to zero and less than .05. That is, the effect of cooperative learning and self-assessment in the posttest had an effect on the motivation scores of students in traditional, self-regulated, and cooperative groups.

Table 2 indicates that there is a significant difference between traditional and cooperative groups, between traditional and self-regulated groups, and between self-regulated and cooperative groups in terms of self-motivated learning strategies. So that, the mean scores of self-motivated learning strategies in the posttest are the minimum for traditional group and the maximum for self-regulated group. Hence, with 95% confidence, it can be claimed that "collaborative learning and self-assessment" have a positive impact on promoting students' "self-regulation" in geometry. With regard to the second hypothesis, the above table represents that the significant level for learning teaching methods is less than .05, i.e. cooperative learning and self-assessment had an effect on students' achievement scores in the posttest.

According to Table 3, the significant level for the effect of learning teaching methods is less than .05. That is, cooperative learning and self-assessment make changes in the students' academic achievement test scores in the

Table 4. Test- Tukey results to compare the groups in terms of achievement after test.

Indices Variable	Groups	Significance level	
Positive impact on students achievement	Traditional	cooperative	0.044
		self-regulation	0
	cooperative	self-regulation	0.03

posttest.

The significant level for interactions within and between groups is equal to .854 and more than .05. That is, the effect of learning teaching method on the achievement scores of students in traditional, self-regulated, and cooperative groups is statistically alike.

The significant level is equal to zero and less than .05, that is, the collaborative learning and self-assessment in the students' posttest scores created a significant difference in the academic achievement of traditional, cooperative and self-regulated groups. Tukey's post hoc test determined the difference between any two groups.

Table 4 shows that there is a significant difference between the traditional and collaborator groups, between traditional and self-regulated groups, between self-regulated and collaborator groups with regard to their academic achievement. It is in the way that the mean scores of self-motivated learning strategies in the post-test for the self-regulated group and the traditional group are the maximum and the minimum, respectively. Hence, with 95% confidence, it can be claimed that "collaborative learning and self-assessment" have a positive impact on students' achievement.

Conclusion

The current paper describes the effects of teacher assistants' collaborative learning and learners' self-assessment on self-regulation and academic achievement at high levels and collaborative learning teaching method is used for one group and the other group had also the same as well as learners' self-assessment for eight 90-min-sessions. We also used learning techniques questionnaire, MSLQ and a self-developed achievement test to measure the geometry in the lower and upper levels of the cognitive domain, it was revealed that "cooperative learning and self-assessment" have a positive effect on promoting learners' "self-regulation" knowledge for geometry course.

The findings of this study show that "cooperative learning and self-assessment" have an effect on promoting students' "self-regulation" in geometry. In addition, cooperative learning and self-assessment have a positive impact on academic achievement at low and high levels of cognitive domains. To assess the validity of the results, Cronbach's alpha coefficient was used and the results showed that the questionnaire has acceptable levels of reliability and validity.

Conflict of Interests

The authors have not declared any conflict of interests.

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