Enhancing the Academic Self-efficacy and Social Competency in Elementary School Students: The Use of Brainstorming Instuction in Social Studies

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Abstract: The current study aimed to examine the effectiveness of brainstorming instruction on academic self-efficacy and social competency of female sixth grade elementary school students in social studies. The method of the present study was quasi-experimental with pre-test and post-test design with control group and the statistical population included 643 female sixth grade elementary school students of Genaveh city, Iran in 2022. Participants were 30 people who selected by accessible sampling method and assigned to experimental and control groups. We used the Morgan-Jinks Student Efficacy Scale and the Felner etal. (1990) social competency scale for collecting data. The experimental group received brainstorming instruction based on Karami et al. (2014) brainstorming protocol. The results indicated that the brainstorming instruction improved the academic self-efficacy and each of its components, namely the talent, texture and effort of female students in the experimental group compared to the control group. Furthermore, the intervention enhanced social competency of female students in the experimental group as well. Overall, the insights gained from this study can be used to guide teachers to identify the most effective brainstorming strategies within an academic setting.

Keywords: Brainstorming instruction, Academic self-efficacy, Social competency, Elementary students

Introduction

Brainstorming or technical brainstorming is based on negotiation. It is one of the techniques for encouragement group creativity by which ideas and thoughts are shared among members extemporaneously in order to reach solutions to practical problems (Al-Samarraie & Hurmuzan, 2018). The teacher, who is the leader of the group, notes all the contents and conversations. In this way, solutions to problems can be found with a group participation and brainstorming. In addition, because everyone should participate in the discussion, it increases creativity. Therefore, role of teacher in such groups is very important (Ritter & Mostert, 2018). The topics that can be discussed in this technique can be any topic that seems interesting to the students, even about social problems such as proper disposal of waste, saving water and many personal and social problems. By the way, many times, students present solutions that may not be thought of by other members of society. For this reason, our thoughts are often molded and found a specific direction (Rahbar et al., 2018). On the other hand, the teaching method of brainstorming means using the brain to attack a problem. Brainstorming is the implementation of a meeting method in which a group tries to find a solution for

a particular problem by presenting all their ideas. In this way, you can first plan the topic and then ask all the students in the class to present ideas.

Academic self-efficacy is one of the most important concepts related to students' academic life that can have an effective role on their lives. Academic self-efficacy is defined as a person's ability to understand his abilities to perform tasks necessary to achieve academic goals (Chen & Su, 2019). Students with higher academic self-efficacy have better academic adaptation and use more useful learning strategies. Academic self-efficacy is a person's belief in his abilities to organize and implement the necessary actions in future situations (Garcia et al., 2015). In other words, self-efficacy is a person's belief in his abilities to succeed in a given situation. Bandura considers such belief to be the determining factor of people's way of thinking, behavior and feelings (Whannell et al., 2012). Academic self-efficacy, specifically, means confidence in performing academic tasks such as reading books, answering questions in class, and preparing for exams. High levels of academic self-efficacy lead to higher average grades and persistence to complete assignments, as a result, students with higher academic self-efficacy have better academic adjustment (Feldman & Kubota, 2015). Perceived self-efficacy is defined as a person's judgment of his capabilities and abilities to perform a specific activity in order to achieve a specific result. Self-efficacy levels can increase or decrease motivation (Moghari et al., 2011). Students with high levels of self-efficacy are attracted to difficult and challenging assignments and do not avoid them. Also, students' personal self-efficacy beliefs determine their motivation level; That is, how much they persevere and how much they resist difficulties and obstacles and do not stop trying (Kostagiolas et al., 2019).

Social competence is among the variables that are effective in students' performance. Social competence includes a set of skills, the acquisition of which improves people's social awareness. Awareness focuses on the ability to understand others and communicate effectively with them, social responsibility, maintaining personal awareness and managing relationships. In other words, social competency is the capability and conditions of having cognitive, social, emotional skills and behaviors that are necessary for healthy growth and adaptation to the social environment. Therefore, considering the complexity of today's societies and the occurrence of psychological and behavioral abnormalities, it is necessary to pay more attention to the teaching of social competence skills through the curriculum is felt more than ever, because the learning of social competence skills and the success of schools in teaching these skills can reduce many of the problems of the society (Seif, 2017). Furthermore, social competence is the power of establishing social interaction that is, acquiring skills, abilities, and capacities that include cognitive skills, social skills, emotional adequacy, and motivational cues. In other words, social competence includes information and skills that enable a person to perform job duties and daily life exchanges.

By examining the previous, it was found that there has not been a direct research on the effectiveness of brainstorming teaching method intervention on academic self-efficacy and social competency. Nevertheless, some studies examined the effectiveness of BS on some cognitive outputs in students. For instance, Hidayanti et al. (2018) examined the effect of brainstorming on students' creative

thinking skill in learning nutrition. Results indicated that there are statistically significant differences between experimental and control group in creative thinking skills test. The result is in the favor of the experimental group, indicating the effectiveness of brainstorming in developing students' creative thinking skills in learning nutrition. In another study Ghabanchi and Behrooznia (2014) investigated the effect of brainstorming as a pre-reading strategy on reading comprehension ability as well as critical thinking ability in EFL learners. The results indicated that brainstorming strategies have a positive significant effect on both critical thinking ability as well as reading comprehension ability of the participants.

The brainstorming method can help learners as a means to remember the concepts and principles needed to solve problems. Self-confidence and social adequacy are probably the most effective states on all students' behaviors. Correspondingly, the main question in this research is whether the brainstorming teaching method is effective on the academic self-efficacy and social competence in sixth grade elementary school girls in Ganaveh city (Iran) in the social studies context.

Material and Methods

In this research, a semi-experimental method with a pre-test-post-test design and control group was used. The statistical population of this research included 643 female sixth grade elementary students in Ganaveh city (Iran) in 2021. Participants were 30 sixth grade female students that randomly assigned to control and experimental groups (15 people in each group). Participants in the experimental group were subjected to the intervention of the brainstorming teaching method for 6 sessions, but the control group did not receive any intervention. Inclusion criteria were: 1- no acute mental and personality disorders (based on personality test) 2- no physical or psychological illness 3- motivation of the student to attend meetings regularly. Also, the explosion criteria were 1- not attending more than two consecutive meetings 2- a request for non-cooperation by the individual 3- lack of motivation to perform the activities. In the discussion of ethical considerations, the subjects were assured that collected data are only for research purposes and there is no need to write names and surnames. On the other hand, the subjects' participation in the research is voluntary and there is no compulsion. Also, the subjects were assured that they can leave the training sessions whenever they want. For collecting data Jing and Morgan's Academic Self-Efficacy Questionnaire and Felner's Social Competence Questionnaire were used that have been described following:

Jing and Morgan's Academic Self-Efficacy Questionnaire: This scale was developed by Jinks and Morgan (1999) that has 30 questions. This questionnaire has three subscales (talent 1 to 10, texture 11 to 20 and effort 21 to 30). The questions of this questionnaire are in the form of a two-point Likert scale (yes and no). This questionnaire is based on the Likert scale (I completely disagree 1, I disagree 2, I agree 3 and I completely agree 4). The scoring method of this questionnaire is that questions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 21, 24, 25, 26, 28, 29 and 30, if the respondent marked completely agree, he gets 4, if he marked somewhat agree, he gets 3, if he marked somewhat disagree, he gets 2, if he marked completely disagree, he gets 1 And questions 4, 5, 15, 16, 19, 20, 22 and 23 are

reversed. If the scores of the questionnaire are between 30 and 52, the level of self-efficacy of the student in this society is weak. If the scores of the questionnaire are between 52 and 75, the student's self-efficacy is at an average level. If the scores are above 75, the student's self-efficacy is very good. Jinks and Morgan (1999) have reported the acceptable validity and reliability for this scale. The reliability of this scale in the present study was obtained by Cronbach's alpha coefficient of 0.86.

Prandin social competency questionnaire based on the Flenner model: The social competency questionnaire was created and standardized by Parandin (1996) based on the four-dimensional model of Felner (1990). Social competency includes four factors that are measured based on some questions of the social competency questionnaire. Social competency questionnaire that includes four dimensions of behavioral skills, cognitive skills, emotional skills and motivational cues and has 47 questions. In Piri and Asadian (2013), the Cronbach's alpha coefficient for this questionnaire was estimated to be above 0.70. Also, in the present study, Cronbach's alpha coefficient was 0.76

Karami et al.'s brainstorming teaching protocol (2013): In this research, the brainstorming teaching protocol was presented to female students of sixth grade in 6 sessions. Students noted some points about each of the concepts in each session. Each of the students expressed their opinion without fear of whether it is right or wrong. The teacher told the students to answer the questions however they like, but their answers should be as short as possible. One of the students wrote down various opinions on the whiteboard, and when no answer was given, the instructor asked the opinion of one of the students to start the discussion again.

Table 1. The content of the protocol of the brainstorming teaching

Session	Content
1	-Implementation of pre-tests (questionnaires(-Getting to know the members of the group with each other -Familiarizing the members with the goals and rules of the group and explaining the activities of each session.
2	The first chapter of the book: Friendship and making friends: Have you ever thought about friendship? Who are your closest friends? What have you talked about with your friends in the last week? What topics do you agree on or in what tasks have you helped each other? Have you ever wondered why we choose our friends? What are the characteristics of a good friend and how can we keep good friends? Assignment: Write the name of one or more of the best friends you've ever had on a piece of paper; Next, write in front of each name why it was important for you to be friends with these people or why you wanted to be friends with them. Read the result in class.
3	The second chapter of the book: Decision making: Have you ever noticed that we make many decisions every day? For example, when we want to go to school in the morning, we may decide to take the bus instead of walking, or when we come home from school, we may decide to do our homework first and then play. In the evening of a day off, we decide to visit family or watch TV at home. Assignment: Think together and say whether each of these decisions is positive or negative in your opinion? Why? What is the result of each decision and what does it affect? Tell or write a short memory about one of your decisions and its good or bad effects.
4	The seventh chapter of the book: Free time: Have you ever thought about your daily life schedule? How many hours do you sleep a night? How many hours do you spend at school? How long do you watch TV or play games? How much time do you devote to worshiping and reading the Quran? What do you like to do when you finish your homework and daily tasks? In your opinion, isn't it better to plan our daily activities and free time? What are your plans for the holidays of

	the year or your summer vacation? Homework: On a piece of paper, list the tasks and activities you have done so far to fill your holidays or summer vacation.
5	The eleventh chapter of the book: Standing against foreigners: Before the victory of the Islamic Revolution, the colonialists had infiltrated our country in different ways. The Islamic revolution shortened the hands of foreigners from the country. Most of the influence and interference of foreigners in our country was during the Qajar and Pahlavi reigns. The word colonization means settlement; However, if a country interferes and infiltrates other countries under the pretext of settlement in order to loot the resources and wealth of that country, it is called a colonialist country. Assignment: Write on a piece of paper, why do you think Mirzakochek Khan Jangli revolted?
6	After reviewing the assignment, the students had a brief overview of the sessions and gave feedback to each other in this regard. -Implementation of post-tests (questionnaires)

Results

According to Table 2, the normality of data was approved. The research hypotheses were analyzed in Tables 3 to 6.

Table 2. Kolmogorov-Smirnov test results for normal distribution assumption

Variable	Group	Statistic	p
Academic self-efficacy	Experimental	0.12	0.2
	Control	0.19	0.12
Social competency	Experimental	0.11	0.2
	Control	0.09	0.2

The results of the Kolmogorov-Smirnov test in Table 2 show that the significance level for the variables of academic self-efficacy and social competency is greater than 0.05, so the Kolmogorov-Smirnov statistic for the variables is not significant. Based on this, the normality of data was accepted.

Table 3. Descriptive data for academic self-efficacy components and social competency of experimental and control group in the post-test stage

Variable	Experimental		Control	
	Mean	SD	Mean	SD
Talent	11.60	0.34	8.14	0.39
Texture	10.25	0.43	8.50	0.36
Effort	10.18	0.39	8.61	0.46
Social competency	15.34	0.45	11.52	0.47

The results showed that the average score of academic self-efficacy and each of its components, i.e. talent, texture and effort, in experimental group in the post-test were higher than that of the control group. Also, the results indicated that the average of the social competency in the experimental group in the post-test is higher than that of the control group as well.

Table 4. Summary of the results of multivariate covariance analysis on the post-test scores of components of academic self-efficacy

Effect	Test	Value	F	DF1	DF2	p	Eta
Group	Pillai's trace	0.852	21.92	3	24	0.001	0.852
	Wilks' lambda	0.148	21.92	3	24	0.001	0.852
	Hotelling's trace	5.76	21.92	3	24	0.001	0.852
	Roy's largest root	5.76	21.92	3	24	0.001	0.852

The results showed that there is a significant difference (P<0.0001) between the experimental and control groups in at least one of the components of academic self-efficacy, i.e. talent, texture and effort. Results of one-way covariance analysis embedded in MANCOVA were provided in table 5.

Table 5. Results of one-way covariance analysis embedded in MANCOVA for academic self-efficacy component

Effect	Variable	SS	DF	MS	F	p	Eta
Group	Talent	30.73	1	30.73	16.91	0.001	0.424
	Texture	20.12	1	20.12	6.86	0.015	0.23
	Effort	32.65	1	32.65	19.66	0.001	0.46

The results indicated that there is a significant difference between the experimental group and the control group in terms of each of the components of academic self-efficacy, i.e. talent, texture and effort. In other words, the intervention of the brainstorming teaching method improved each of the components of academic self-efficacy in the experimental group compared to the control group.

Table 6. Results of one-way covariance analysis of the effect of brainstorming teaching method on social competency

Source	SS	DF	MS	F	p	Eta
Pretest	0.706	1	0.706	0.232	0.63	0.009
Group	108.94	1	108.94	35.71	0.001	0.56
Error	82.36	37	3.05	-	-	-
Total	5605	40	-	-	-	-

The results of one-way covariance analysis showed that after the control of the effect of the pre-test on the social competency, the difference of means of both groups is significant (P<0001). Therefore, the brainstorming teaching method intervention has improved the social competency in experimental group compared to the control group. According to the effect size, brainstorming teaching method intervention explained the 57% variance of social competency.

Discussion

The present study aimed to examine the effectiveness of brainstorming teaching method intervention on academic self-efficacy and social competency in sixth grade elementary school girls in Ganaveh city (Iran) in social studies course. The findings showed that the intervention of the brainstorming teaching method improved the social competency of female students in the experimental group

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compared to the control group. Also, the intervention of the brainstorming teaching method improved academic self-efficacy and each of its components, i.e. talent, texture and effort of female students in the experimental group compared to the control group. The findings of the present research are in line with the findings of Ghabanchi and Behrooznia (2014), Rahbar et al. (2018), Göçmen and Coşkun (2019) and Abedianpour and Omidvari (2018).

Social competency is among the variables that are effective in the academic status of students. In other words, social competency is the competence and conditions of having cognitive, social, emotional skills and behaviors that are necessary for healthy growth and adaptation to the social environment. Therefore, considering the complexity of today's societies and the occurrence of psychological and behavioral abnormalities, it is necessary to pay more attention to the teaching of social competency skills through the curriculum. On the other hand, academic self-efficacy is defined as a person's ability to understand his abilities in performing the necessary tasks to achieve academic goals. Students with higher academic self-efficacy have better academic adaptation and use more useful learning strategies. Academic self-efficacy is the belief that a person has in his abilities to organize and implement the necessary actions in future situations. In the brainstorming experience, the participants have some opportunities to gain successful outcomes and this improves the self-efficacy.

In discussing the limitations of the research, it should be stated that the length of the training classes sometimes caused the fatigue of the experimental group students during their attendance at the meetings. Therefore, it is suggested to consider the intervention of brainstorming teaching method in the form of supplementary programs along with other educations for students in social studies and observe the very positive effects of this teaching method in improving the academic self-efficacy and social competence of students.

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