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Comparison of the Effectiveness of Exploratory Group Training and Conceptual Learning in Science Lesson on the Academic Self-Efficacy of Fifth Grade Male Students

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Research Paper

Abstract

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Purpose: The aim of the present study was to compare the effectiveness of group exploratory and conceptual learning in science lessons on the academic self-efficacy of male students.

Methodology: The current research was applied in terms of its purpose and in terms of its implementation, it was a semi-experimental research with a pre-test-post-test-follow-up design with a control group. The statistical population of this research was the fifth grade male students of Kiyar city in the academic year of 2020-21. The research sample consisted of 75 male students in three experimental groups of exploration, concept learning and control (25 people in each group) who were selected by multi-stage cluster random sampling from 3 schools and 3 classes. The research tool was the self-efficacy questionnaire of Jenkins and Morgan (1999) and the intervention was the method of exploratory group training and concept learning group training for 10 sessions (each session 45 minutes) which was implemented for both experimental groups. For data analysis, inferential statistical methods (repeated measurement analysis and Benferroni post hoc test) were used with Spss24 software.

Findings: The results showed that both exploratory group training and conceptual learning increased academic self-efficacy scores compared to the control group. But there was no significant difference between the average scores of exploratory group training and conceptual learning. In other words, both methods of exploratory group training and concept learning group training equally increased academic self-efficacy scores ($P < 0.05$).

Conclusion: Based on the findings, it can be concluded that the group teaching of exploration and conceptual learning increases the academic self-efficacy of students in the science course. Therefore, lesson planners can pay more attention to these methods and also elementary school teachers can use these educational methods in teaching science lessons to better understand students and their academic self-efficacy.



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Detailed abstract

Purpose: Purpose: The courses of the elementary course are very effective in shaping the knowledge and developing the primary talents of the students of this course. One of the important subjects of the curriculum of this course is experimental science, which, according to its goals, is to familiarize students with the surrounding environment and to know the surrounding environment in various aspects, including it. Many studies show that the importance of science lessons in students' learning is inevitable and leads to the development of their creativity. The purpose of science education is to educate students to acquire the knowledge, skills and attitudes and generally the skills needed in life. Self-efficacy is one of the important topics in the field of learning and motivation that has been the focus of researchers' studies in the last decade. Bandura (1997) in his cognitive and social theory considers self-efficacy as the belief that a person can master a certain situation and create consequences according to his own interests. Self-efficacy is a person's judgment about his abilities to plan and execute action to achieve a specific goal, and he believes that self-efficacy is an important factor in the learning process. Self-efficacy plays a role in academic motivation and learning motivation, especially the ability of learners to manage their learning activities and resistance to learning. Under self-efficacy, academic self-efficacy has also been mentioned, which expresses the self-confidence of learners in doing academic activities. Academic self-efficacy specifically means the learner's judgment about his ability to successfully achieve educational goals, which in fact makes the student value his abilities and gain greater levels of self-confidence for success. Academic self-efficacy can increase learning and academic performance by applying extra energy and willpower when completing tasks, remaining determined when facing obstacles, and choosing difficult learning tasks instead of easier ones when given a choice. In every educational system, the level of academic self-efficacy of students is considered one of the indicators of success in scientific activities. Academic self-efficacy as a motivational factor is the effect of several factors, among which the role of teacher training method is very important. Student-centered teaching methods can develop many skills in an individual. Many students believe that learning some subjects and related issues is difficult. Meanwhile, the use of active teaching-learning strategies is highly emphasized. The aim of the present study was to compare the effectiveness of exploratory group training and conceptual learning in science lessons on the academic self-efficacy of male students.

Methodology: The current study was applied in terms of purpose and semi-experimental in terms of implementation method with a pre-test-post-test design and follow-up (1 month later) with a control group. The statistical population of this research was the fifth grade male students of Kiyar city (Kurd city) in the academic year of 2020-21. The research sample consisted of 75 male students in three experimental groups of exploration group, conceptual group training and control (25 people in each group) who were selected by multi-stage cluster random sampling from 3 schools and 3 classes. The criteria for entering the research included the age of 11 years and not repeating the basic, and the criteria for leaving the research included not being absent for more than two sessions and avoiding training other than exploratory group training methods and conceptual learning to the two experimental groups during the intervention period. The method of conducting the research was such that after the research sample was determined, a meeting was held with school principals and the method of cooperation and the time of conducting the research were coordinated with the school. Also, another meeting was held with the students themselves and even some of their parents to conduct the research. First, before implementing any intervention, a pre-test was taken from all three experimental and control groups and the results were recorded. Then the intervention took place in the school and at the designated time, the researcher together with another expert in the field of educational evaluation with a specialized doctorate simultaneously applied group training sessions of exploration and conceptual learning for each experimental group separately. All sessions (10 sessions for each educational method and 40 minutes each session) were held in the morning with the enthusiasm of the students and even some of their parents who voluntarily attended the school. Then, one week after the end of the intervention, the post-test was done for all three experimental and control groups, and after 2 months, the groups were followed up with the relevant test and the results were analyzed. The research tool was Jenkins and Morgan's self-efficacy questionnaire (1999) and the intervention was exploratory group training and concept-learning group training for 10 sessions (45 minutes each session), which were implemented for both experimental groups. To analyze the data, variance analysis methods with repeated measurements and Benferroni's post hoc test were used in Spss24 software.

Findings: The results showed that both exploratory group training and conceptual learning increased academic self-efficacy scores compared to the control group ($P < 0.05$). But there was no significant difference between the average scores of exploratory group training and conceptual learning. In other words, both methods of exploratory group training and concept learning group training equally increased academic self-efficacy scores.

Conclusion : Based on the findings, it can be concluded that exploratory group training and conceptual learning increases the academic self-efficacy of students in science courses. Therefore, curriculum planners can pay more attention to these methods and also elementary school teachers can use these educational methods in science lessons for their academic self-efficacy. This research had some limitations. The statistical population of the research was limited to elementary school students, so caution should be exercised in generalizing the results to other communities. Also, considering that this research was done only in the schools of Kiyar city; Therefore, caution should be taken in generalizing the results to other regions and cities. Also, in the current study, the gender of the students was not investigated, which may have an effect on the results. Another limitation was that the length of the follow-up period was short-term, so to ensure the stability of the trainings, it is necessary to increase the length of the follow-up period. Therefore, it is suggested that in the future, while controlling external intervening factors, researchers should also study the gender of students and consider the follow-up period more. It is suggested that teachers and students be given the necessary training in the field of exploratory group training and conceptual learning. Considering the effect of exploratory and concept learning group training in science lessons on increasing academic self-efficacy, it is suggested to use other active and innovative methods for students' learning, such as exploratory and conceptual learning group training.