An assessment of the effect of training in cognitive and meta-cognitive strategies on academic achievement of the first-year high school students with academic weakness in Southern Khorasan province

Hasn Meshkatie\textsuperscript{a1}, Khalil Allahvirdiyani\textsuperscript{b}, Sanaz Barzegar Kahnamouei,\textsuperscript{c} Azadeh Lohrasbi,\textsuperscript{d}

\textsuperscript{a}Educational organization of South Khorasan Province, Khorasan, Iran
\textsuperscript{b}Allameh Tabatabaii University, Dehkhade Olympic, Tehran, Iran
\textsuperscript{c}Tehran University, Jalale ale ahmac, Tehran, Iran
\textsuperscript{d}Allameh Tabatabaii University, Dehkhade Olympic, Tehran, Iran

Abstract

The aim of this research was to study the effect of instruction of these strategies by school counselors, in educational progress of the students in the first year of high school, with weakness in their studies, in province of South Khorasan. The sample of research was selected with the method of available (accessible) sampling with 60 individuals (30 girl and 30 boy). In order to evaluate the effect of independent variant (instruction of strategies), criteria of changing in results of examinations of the second term (stage) from the first term, considered in two groups of trial and control. Additionally, for controlling of other variants the schools were selected from different locations and randomly. In order to control the variant of counselor’s motivation and also for evaluation the extent of learning skills by counselors, a final examination was performed without prior notification, at the end of educational-instructive course. Research results demonstrated that instruction of these strategies was ineffective in total for group of the trial, while the variant of ability-motivation of the counselor comes for interpretation, the instructions have been effective for the group. It means that the students who have instructed by motivated and capable counselors, have progressed in their studies. The effects of these instructions were different for various lessons and maximum effect observed in mathematic. Furthermore, these effects were different for two genders.

Keywords: metacognition, metacognitive strategy instruction, effect

Introduction

One of common and remarkable problems in children and students is a disorder in academic performance, in such a way that in the some educational conditions, some students show weaker performance (Chen, Rubin). There are a lot of students who have normal appearances, their physical growths, heights and weights indicating to be normal,
their intelligence being some low average, speak well; play like other children, and don’t have any problems in communicating with others; low ever, when they go to school and they went to learn reading, writing and courting, they go into serious problems (Coopersmith, 1967).

Hersko and Reied (2005) state that the study of meta-cognitive variables (that is, predicting, planning, investigating and monitoring) is likely to result in a better understanding of low these variables function and this understanding in turn is likely to cause more effective pedagogical interventions. At present, meta-cognition seems to be a hope for helping authorities with better recognition of people with learning disorders.

According to information processing psychology, learning is defined as the process of receiving environmental stimuli by sensory receptors, passing this stimuli through sensory memory and short-term memory, getting meaningful, and finally being placed in long-term memory (Crawford & linger 2004). Therefore, every measure that facilitates the above process, that is helps information processing, in fact world help learning and recalling (Finn & Rock 1997). Measures that have been devised by psychologist and authorities in the psychological domain for this purpose are called learning methods or skills, or more accurately cognitive and meta-cognitive strategies (Seif, 2008:2).

Materials and method of research

The present research is analytic-empirical research, which was conducted on both experimental and control groups. After having selected a sample of secondary schools in Southern Khorasan Province (sampling unite was class), they were randomly subjected to experimented and control conditions. In the research, first-term scores were used as a pretest. Since in the research, the researcher manipulated the independent variable at his/her discretion and also, subjects were randomly assigned to experimental and control groups, that is experimental conditions were completely present, the research is of experimental type with two experimental and control groups and a pretest and a posttest. The pretest and posttest design with control group is consisted of two subject group, which both groups are measured twice. The first measurement is done by a pretest and the second are is done by a posttest. The researcher places a half of the subjects in the first group and the other half in the second group to establish groups using the random sampling method. Two groups which are establishing by the method are similar and the measurement of the dependent variable is done at the sometime and under some conditions. The sample of the research was selected by the method of available sampling. The sample was consisted of 60 individuals (30 girls and 30 boys).

Data collection tools

Data collection tools are teacher-made tests that teachers administer in the first and the second terms. These scores were used as pretest and posttest scores. Also, in order to evaluate a learning rate of cognitive and meta-cognitive by counselors, a researcher-made test was used. The test included close-ended and open-ended questions; low ever, most questions were open-ended. Since the test needed to be administered immediately after presenting materials, presenting recognition questions caused scores to be increased unreal. Test scores indicate both comprehension abilities and learning powers of counselors, and their motives for cooperation with investigator. Some people may generally have abilities; low ever, they don’t care and learning is low when work is not important to them. In contrast, these are motivated people who have low scientific degree and comprehension, which have week learning.

Data analysis

In the research, descriptive statistics and inferential statistics were used. Descriptive statistics was used to investigate the distribution of the sample in different variables such as district, sex, etc.; inferential statistics was used to reject or confirm hypotheses. For hypotheses, multivariate regression, variance analysis and T-test were used.
Results

Findings indicated that students with academic weakness who had trained in cognitive and meta-cognitive skills, had better academic achievements than those who had not trained and the effect of training in cognitive and meta-cognitive on different subjects was different (Gaskin-Butler & Tucker, 1995, Smith, 1991). Also, it was recognized that there was a significant relationship between the learning rate of skills by counselors and the achievement rate of students, in such a way that the effect on mathematics was the highest, followed by Persian language and biological sciences and hygiene.

In this research, the effect of cognitive and meta-cognitive trainings on subjects religions teachings and Koran, Arabic (I), English, Physics and Laboratory, Chemistry and Laboratory and Social studies was the least. Also, it was recognized that the effect of training in cognitive and meta-cognitive skills on both sexes was different (Kendall & Panichelli-Mindel, 1955, Zand & Thomson, 2005).

Applied suggestions

1. As in the research, the effect of training in cognitive and meta-cognitive strategies on learning Mathematics and some other subjects has been confirmed, it is suggested that these trainings should be presented to interested counselors, so that they in turn train students and be effective on their academic achievements, therefore seeing developments in academic positions in the province;
2. Investigating the causes of why some counselors are uninterested and taking actions to increase their motives and their interest;
3. Making teachers familiar with cognitive and meta-cognitive skills in parallel with their subjects;
4. Performing programs in the Education Department –as a pioneer in the society culture- to increase research culture between students and teachers;
5. Producing programs on TV and in the press to disseminate research culture between on the ground and teachers.

References