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# The effect of learning strategy on computer anxiety

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## Abstract

This study investigates the effect of learning strategy training on computer anxiety and achievement among 37 students attending a computer Programming Languages II course. The study uses an experimental research model including pre- and post-test instruments in which experimental and control groups take place. The subjects in the experimental group were trained on how to improve their learning strategies; on the other hand, the subjects in the control group were only given a seminar on the issue without given any training. Subjects' learning strategies and computer anxiety were defined according to the "learning strategies scale" and "computer anxiety scale" given before and after the study to the students. Learning strategy and computer anxiety scores were compared with finding out the effect of treatment on subjects' learning strategies. Students' learning strategy and computer anxiety scores obtained at the end of the experiment by each group were compared using students' *t*-test.

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## 1. Introduction

Learning is a process that an individual realizes through the establishment of a relationship between previous knowledge and experience stored in the memory, and newly encountered ones (Wittrock, 1992). As for learning strategies (LS), these are cognitive processes that are carried out by learners in order to grasp and gain the new information easily (Brandt, 1988/1989).

Learning strategies are the learners' ways of directing themselves, thus gaining independent learning abilities in learning process. LS are defined as necessary tactics and tools for independent learning (Apps, 1990; Lorenger, 1994; Weinstein & Mac-

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donald, 1986). Therefore, LS are viewed as requirements of independent learning (Ellis, Deshler, & Lenz, 1991; Lenz, 1992; Loranger, 1994; Weinert, 1983) which are defined by Resnick as “mental processes applied to make understanding and learning of new knowledge easier” (Brandt, 1988/1989).

The interest in LS arose as a result of shifting from behaviorist to cognitive theories. The main difference between these two theories is that the former defines the teaching–learning process with a stimulus–response model, the latter on the other hand, underlines the process that occurs between these two actions or the way knowledge is perceived and constructed in memory. Consequently, learning from the behavioristic model is viewed as a direct behavioral result of changing the environment which is regarded as stimulus; learning from the cognitive model on the other hand, is viewed as changing behaviors of learners by means of improving their cognitive efficiency and capacity. That is, LS are tools or techniques for activating or making cognitive processes easier on the basis of principles of operating and coding information presented in cognitive learning model.

To define and categorize LS, researchers have put forward various taxonomies (Dansereau, Brooks, Holley, & Collins, 1983; Pintrich & Garcia, 1991; Weinstein & MacDonald, 1986; Weinstein & Mayer, 1986). LS are divided into two major groups within most of these taxonomies; as cognitive and metacognitive strategies.

Dansereau et al. (1983) classify LS into two general category related to each other: basic (text-based) strategies enable a learner to get the knowledge given in the text; store it in memory and use it when necessary; and support (affective) strategies include techniques for understanding and deciding on the purpose, concentration management which regularizes and keeps the beneficial cognitive environment that enables basic strategies to be used efficiently. In the same way, Weinstein and MacDonald (1986) classify the LS into two main groups as active strategies (cognitive) and support strategies (affective strategies). This categorization differs from Dansereau et al. (1983), in a way that there are techniques and skills of determining the appropriate study place and time, careful focusing and overcoming studying anxiety as well.

LS can be divided into three groups in terms of levels:

1. simple LS.
2. advanced LS.
3. derived LS.

Simple LS are memorizing processes such as reading information from a text aloud or silently, repeatedly, underlying important points and copying. Memorizing strategies provide the transfer of the significant information to the short-term memory in a reading text or list through distinguishing (Garcia & Pintrich, 1994; Pintrich & Garcia, 1991; Weinstein & Mayer 1986). Though memorizing strategies are beneficial for some kind of studies, they might prove insufficient to compile the former knowledge in long-term memory with the new one.

Advanced LS enables the information to be stored in the long-term memory. These strategies not only include expressing and summarizing the necessary information

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