

## **Metacognitive Strategies in Architectural Design Studio Education in Iran**

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### **ABSTRACT:**

*Due to the problems of architectural design education, researchers should look for ways to improve the quality of architectural design education. Some of the problems that researchers enumerate in design education are: Lack of sufficient problem solving skills, Lack of sufficient ability in self-assessment, Lack of ability to analyze cultural and social contexts, Lack of attention to the cultural context of communities in design and studies, Insufficient attention to design theories and perception of the environment. In this direction, using various methods in architectural design education is one of the solutions. Metacognitive strategies are one of the methods that have been discussed in the field of education as a new method. The aim of this study is to identify the effect of metacognitive strategies on architectural design education, therefore, the main question of this research is what effect metacognitive strategies have on the quality of architectural design education. This research is a qualitative and semi-experimental study that has been done inductively by collecting regular and classified data, and seeks to explore issues surrounding architectural design education. The results of this study show that this model in architectural design education has led to the efficiency of design education, and increases empathy and problem-solving skills among students.*

**KEYWORDS:** *Design Education, Architecture, Metacognition, Education process.*

### **INTRODUCTION**

Nowadays according to the high speed of communication and information technology, new theories and perspectives in the field of education are gathering from every corner of the world. In this way, the analysis of various methods of education that are used around the world, especially in developed countries, will improve the knowledge and quality of education. One of these methods, which has been discussed in the field of education for several years, is the issue of metacognitive strategies.

In this research, an attempt has been made to test the quality of education by using a specific method of metacognitive strategies in the process of architectural design study in two consecutive semesters. Although the issue of metacognition in the field of education has been discussed for many years, but its impact in the field of architecture education has not been studied so far, as such, many educators are not yet familiar with the performance and results of these strategies. Therefore, research in this field can be effective in introducing new teaching methods and their effectiveness among educators.

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### **Research Questions:**

Considering that the purpose of this research is to improve the quality of architectural design education through the use of metacognitive strategies, therefore, an attempt has been made to study the extent of these strategies by using metacognitive strategies in the process of architectural design study. Thus the research questions are:

How can metacognitive strategies be more effective in the process of architectural design study?

How effective are the metacognitive strategies tested in promoting architectural education?

### **Literature Review:**

Achieving definitions of metacognition, Critical education and active-experiential study, encourages students to explore and critically analyze and develops their intercultural knowledge and skills. [7].

Nelson identifies three basic skills, including planning, monitoring, and evaluation. In planning skills, considerations, decisions and predictions related to the beginning of the learning process are considered by the learner. Supervision emphasizes the learner's functions and actions while learning and metacognitive assessment skills also indicate how the learner judges the process and results of his or her own thinking and learning. [6]. The most common division of metacognitive components is to divide it into two parts: metacognitive knowledge and metacognitive skills. Metacognitive knowledge refers to an individual's expressive knowledge about the relationship and interaction between learner characteristics and the task and strategy and metacognitive skills are related to the learner's awareness of practical methods of organizing their activities in the field of thinking and problem solving. [4]. The planning strategy involves setting an aim to learn and analyzing how to deal with the issue. Strategy to control and monitor learner evaluation of their work, in order to know the progress of the observer and finally the regulation strategy, while creating flexibility in the learner's behavior, Makes the learner change his / her learning method if necessary. [10]. Every metacognitive training program for effectiveness must have three aspects, Self-diagnosis tool, cultivating thinking style, and memory, and finally adaptation strategies and continuing access to appropriate resources to increase metacognitive awareness [1].

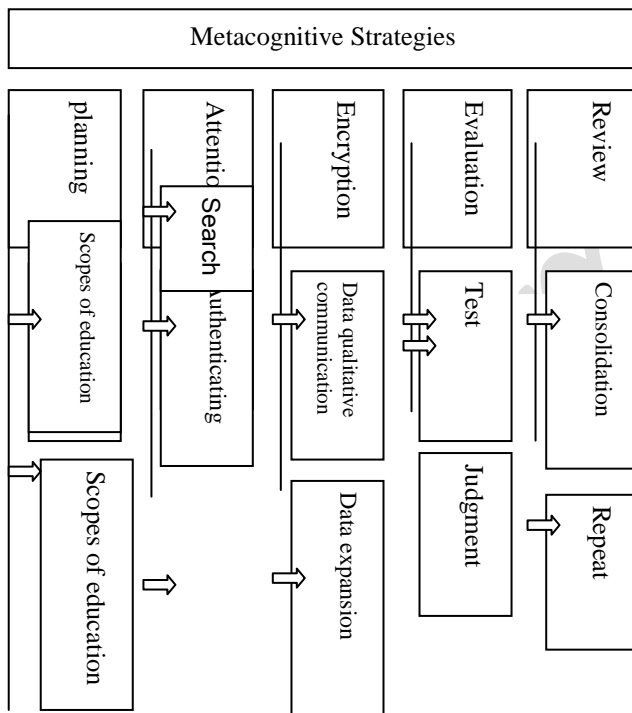
"Brisin" classifies metacognitive strategies into five categories of regulatory strategies: Planning, attention, coding, review and evaluation.

At the same time, the results of a study on social relations and mental health show that the stronger the conscience, the stronger the metacognition, and vice versa. A very strong relationship between conscience and metacognition shows that these two variables have a lot of overlap. And they are practically of the same meaning. This overlap seems to be in the sense that conscience and metacognition, with a possible slight difference, are practically two words for the same concept and although at least both are functions of the same concept and variable, if we accept this closeness in the concept, we can imagine that conscience is actually related to metacognitive judgment. [9] Thus, with the definitions of various thinkers in the field of ethics who consider knowledge and metacognitive skills, In the first stage, learners are provided with the necessary information about metacognition, and in the second stage, they are taught how to use the acquired knowledge. [8].conscience as something

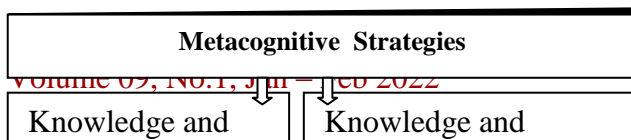
related to empathy, altruism and a kind of morality, one can understand the effect of metacognition on ethics. Thus, by using metacognitive strategies in the field of architecture education, students' empathy can be used to improve the level of education, especially team training and group evaluation of design courses. Because not all learners engage in metacognition on their own, some of them need explicit training to learn such skills. [2]. So far, several metacognitive programs have been designed for learners, including the Thinking Metacognitive Strategies and the 2007 "Panora" and "Filippo" Metacognitive Training Program. Also in the training program of Jagger and partners 2005, which consists of two parts: metacognitive

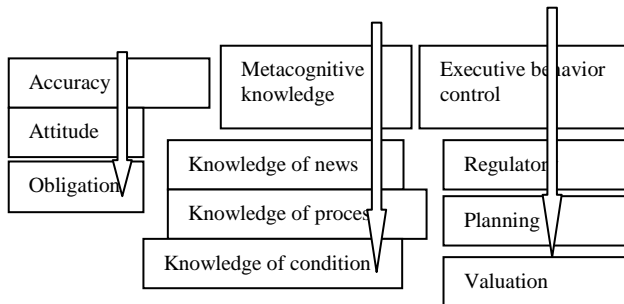
The introduction of the paper should explain the nature of the problem, previous work, purpose, and the contribution of the paper. The contents of each section may be provided to understand easily about the paper.

**Table 1: Metacognitive Strategies via Brezin Approaches. 1980**



**Fig2: Metacognitive Strategies via Paris and Winograd Approaches.1990**





## **THEORETICAL FRAMEWORK**

In the present research, after studying the challenges of architectural design study, the strategic parameters of metacognition have been adapted to the existing problems and appropriate strategies have been proposed for each challenge. For example, in interviews with professors, points such as the need to increase the field of culture, social aspects, climate knowledge, perception of the environment and the ability to solve problems are mentioned, as many experts and professors of the university believe that students have problems in some areas such as design in harmony with the cultural context of society, and most do not have an accurate and comprehensive understanding of neighborhood relationships and social relationships that shape people's lives. Metacognitive strategies can be effective in understanding social relationships. By involving students in the design process through metacognitive knowledge, the quality of education can be improved. Consecutive evaluation during the semester and at the end through two-person discussion sessions, working group, group discussion and critique and evaluation sessions, in order to cognitively teach critique and evaluation and metacognitive education, reviewing and measuring the process through metacognitive strategies can be helpful. Metacognitive strategies can also lead to the development of studies and the inclusion of ideas in the planning process in order to link knowledge and planning.

## **RESEARCH METHODOLOGY AND DATA COLLECTION**

Considering that this research has been conducted in real social conditions and has its own limitations and lack of controls, On the other hand, it is not possible to directly control and observe the exact amount of progress and improve the quality of design education among students, and this evaluation is largely relative, therefore, the present study is a quasi-experimental study. This research is a descriptive-analytical research and uses inferential and inductive explanation, and based on multifaceted interpretations of the experience of architectural design learners and teachers. This research is a qualitative and inductive research. Data collection method using, library studies, observation and field study interview with students of design training studios, with metacognition approach and without it and through questionnaires.

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## **DATA ANALYSIS AND RESEARCH FINDINGS**

According to preliminary findings, proposed educational model based on metacognitive strategies, can improve problem solving ability among students. This method also causes the conscious advancement of the architectural design process and the creation of a structure for it in the minds of students, in order to develop their ability to recognize their thought process and evaluate the outputs in order to increase their ability. Findings show that metacognitive strategies not only have a positive effect on the ability of students to write process and critique their work, it causes better performance of students in the experimental group compared to the control group in achieving success in this course. In this field, metacognitive knowledge through writing the process of one's own works and the work of others is able to compare with mere reliance on advancing the work of architectural design with visual evidence, it has the ability to increase the ability of individuals to plan, monitor and evaluate their work and lead to greater student success. Metacognitive experience while allowing students to describe their work more accurately, has have the ability to analyze problems and evaluate between different methods, as well as increase their ability to have a positive effect on the writing structure, and they also have a greater ability to control their learning.

Another important point about metacognitive planning is the ability of students to critique and evaluate their work. The metacognitive intervention performed in the research shows that the ability of students to write reviews and evaluations has a very positive effect on the development of their metacognitive attitude. This section is also important because it increases their ability to plan and evaluate their work regularly.

The main issue of the present study is whether there is a significant relationship between the success of people in architectural design and their metacognitive ability. In other words, is there evidence to justify efforts to move toward metacognitive education in this area? Research shows that metacognitive strategies can indicate an individual's abilities in perceptual, emotional and reasoning control, and in some cases indicate experiences of emotional stress and avoidance and suppression of thinking.

Therefore, it can be predicted that identification and selection based on psychological factors related to metacognitive beliefs can be considered in measuring the talent of individuals, and also the use of metacognitive teaching methods that lead to increasing students' metacognitive knowledge of the architectural design process, has the ability to be effective in students' success.

## **CONCLUSION**

The results show that due to the weaknesses identified by architecture design professors during the architectural design studio process, and researchers' emphasis on students' inability to start a design project during a logical process for it and the ability to review the process as a metacognitive factor in the success and achievement of the objectives of this course, and to show the relationship between students' success in architectural design courses and their metacognitive ability as the most important strategy in the field of cognition and intellectual coherence of the teaching model provided for architectural design, it includes the development of steps in which at each stage an attempt is made to provide a cognitive training related to architectural design and a metacognitive method for teaching it, and also

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design a process to engage students with the process of metacognitive thinking through the use of metacognitive skills and training based on the successful methods of professors in the field of teaching this course to be presented, to provide the ability to address various aspects of cognitive, metacognitive and skills development of students in this process.

One of the most important motivations of metacognitive teachings for the development of metacognitive perception is the development of the perception of thinking about thinking in students. This means that the student, while recognizing knowledge and recognizing the shortcomings of his knowledge and trying to eliminate it and identifying how to adapt knowledge to variable processes and different design conditions be able to determine his/her own course of action during the design and to correct the process while developing critical thinking within himself. In the educational model designed in the present study with the aim of increasing the ability of students in this field, a template based on worksheets for controlling the thought process by the students themselves and a set of sketches, the process of criticizing others along with trying to intervene intellectually in the process of changing the conditional situation is designed to identify the ability to adapt knowledge and change the process in proportion to changing the position and ability of students. The present model is an efficient model in the architectural design learning system and is able to increase students' ability to systematically and comprehensively understand the design process, the skill of forming a model to convert raw knowledge into knowledge tailored to the needs of each design in students, and be useful in increasing students' critical ability by upgrading the knowledge of shaping and systematizing the design process of students.

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