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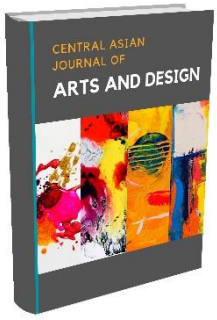

CENTRAL ASIAN STUDIES

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Pedagogical Strategies for Enhancing Creativity in Architectural Design Education at SamDAQU

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Abstract: *The paper introduces a pedagogical strategy composed of two main phases which allows free exploration and guided exploration in a design studio course. It discusses how the strategy employed allows for exercising divergent and convergent thinking processes and create opportunities shifting between them. The exercise used as a part of this pedagogical strategy also has potential to include different conceptions of creativity that are associated with time, domain and culture.*

Keywords: *divergent thinking, convergent thinking, design learning, design pedagogy.*

Introduction

The problems humanity facing in the 21st century have become more complex than ever. Natural disasters such as earthquakes, floods and especially the recent pandemic have reminded us of the need for skillful problem solvers. Many of the problems require creative individuals who are trained in the professions related to built-environment. Thus, the demand for creative thinking, which is an essential skill for problem-solving is needed more than ever.

The Republic of Uzbekistan is aware of this need and started a transformation process in higher education. This paper presents information about the pedagogical strategies in design education particularly in first year design studios at the faculty of architecture in Samarkand State university of Architecture and Construction (SamDAQU) as a part of the transformation process in the institution. It depicts how these pedagogical strategies can support creativity and how it can improve first year students' creative performance.

1.1. The Conception of Creativity – Differences between East and West

Creative thinking has been defined in several ways in the literature [1][2], [3][4][5][6][7]. There have been more recent definitions of creative thinking that focus on the creative process. For example, Kay defined it as "a process whereby the individual finds, defines, or discovers an idea or problem not predetermined by the situation or task" [8, p. 117]. Nickerson [9] suggested that "creative thinking is

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expansive, innovative, inventive, unconstrained thinking. It is associated with exploration and idea generation. It is daring, uninhibited, fanciful, imaginative, free-spirited, unpredictable, revolutionary" [9, p. 397]. Creative thinking involves a process of discovering something novel and useful [10].

Creativity had been considered as a general cognitive ability [11] however there are other factors that shape the conception of creativity. Recent views of creativity assert that the conception of creativity is also associated with time, domain, and culture [12][13][14][15][16][17]. Niu and Sternberg [15] examined the literature on concepts of creativity across different cultures which also made a comparison possible between especially those from the West (such as European and North American countries) and the East (such as Asian cultures). They concluded that there are similarities between people from the East and Western people as well as differences. People from both the West and the East agree on some core characteristics of creativity which include being original, imaginative, intelligent, and independent. The differences lie elsewhere. Western conception of creativity brings forth the personal characteristics of individuals whereas the linkage between current and past in the development of creative products are given more value in eastern conception of creativity [18].

The transformation in design education in SamDAQU is based on these two differences. The pedagogical strategies are aimed towards supporting the existing conception of creative products and process which values establishing linkage between current and past in the development of creative products. On a curricular level, design studios are inserted in the education in the faculty of architecture through new curricula to nurture and nourish individual creativity.

1.2. The Significance and Predicaments of Learning in Design Studio

Physically the studio is a place where students gather and work under the supervision of their studio instructors. Conceptually, the studio is a process of learning by doing, in which students are given a series of design problems to solve. Although learning by doing is a form of learning without awareness of what has been learned, it preserves its effectiveness in design learning by virtues such as learning by self-shaping, trial and error, and discovery. The major effect on design learning is that it provides the opportunity to explore design activity. The implicit learning occurs during these exploratory activities in learning by doing. The individual experience through this exploration enhances creativity in a student.

2. Pedagogical Strategies in SamDAQU

The pedagogical strategies applied in the design studios in SamDAQU take into consideration two differences in the conception of creativity in the light of literature mentioned above. The first point of intervention was to accommodate the encouragement and improvement of individual creativity. For nurturing individual creativity, the design studio is placed at the heart of design education in SamDAQU with weekly exercises for incremental increase in students' creative performance. Physically the studio is a place where students gather and work under the supervision of their studio instructors. Conceptually, the studio is a process of learning by doing, in which students are given a series of design problems to solve. Although learning by doing is a form of learning without awareness of what has been learned, it preserves its effectiveness in design learning by virtues such as learning by self-shaping, trial and error, and discovery. The major effect on design learning is that it provides the opportunity to explore design activity. The implicit learning occurs during these exploratory activities in learning by doing. The

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individual experience through this exploration enhances creativity in a student. Two different courses are structured as design studios: Basic Design and Introduction to Architectural Design.

The second issue was to accomodate the conception of creativity which values establishing a linkage between current and past in the development of creative products, two different strategies were employed. A new learning and making process, Imitation-Iteration-Improvisation (I^3) which is devised by Dina El-Zanfaly [19] is utilized in the Introduction to Architectural Design course. In the Basic Design course, the pedagogical strategy utilized is derived from the experimental studies conducted by the author. The paper presents only the strategies conducted in Basic Design course due to the limitations of the conference.

2.1. Design Exercises

The Basic Design course is a course in the first semester of the first year in the curricula of three different departments. Students are introduced to concepts like shape, form, color etc. During the course, the students were steered into a process composed of two connected exercises which led them to employ different forms of reasoning. The design task was kept the same in both phases, which is nine-square composition problem. The design exercise reported in the studies by Özkar [20][21] is a variation on the nine-square grid problem. It involves an assignment to generate a square composition and ends with an assignment which requires students to position nine of these squares to make a new one. It is composed of two successive and related subtasks. The first subtask requires the participants to design a two-dimensional composition of size ‘a x a’ using only white and black color. Second subtask requires participants to bring nine of the ‘a x a’ square compositions together to make a composition of ‘3a x 3a’. In this task, participants are encouraged to use rotation, mirroring, and to interchange the colors assigned to design elements. The serial tasks challenge the students “to see the continuity in their thought as well as to go through a back and forth process” [20, p. 316].

There are two variations of the same design problem. The differentiation is in the first subtask which involves the design phase of the ‘axa’ unit. In the first, students are left on their own without any instruction. It allows an individual free exploration (FE) of the design problem. In the second phase, the exercise contains a precedent to encourage an associative reasoning process. The students are expected to choose a composition from the set of works by Laszlo Moholy-Nagy. This phase is structured as a more guided exploration (GE).

2.2. First Phase (FE)

In the first phase, the students are left on their own to explore and produce a possible solution to the design task at hand. This individual exploration is encouraged as part of a pedagogical strategy which introduces the implicit type of learning to the students who has no prior experience in design. Starting with such a free design exploration also allows students to focus their attention to understand problem definition.

In creative problem solving a solution to a problem may be unique or there may be several possible solutions [22][23]. The example from the student’s works displays this aspect of creative problem solving very clearly (see Figure 1). The student explores how the initial unit can generate different solutions to the given problem.

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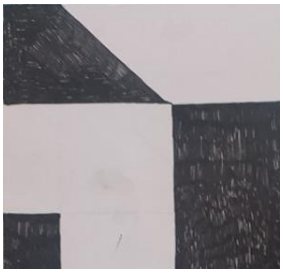
a)



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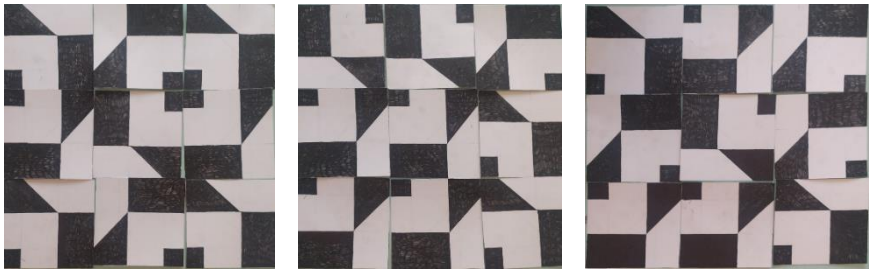

Figure 1. a) Initial unit design proposal by a first-year student. b) Three different nine-square compositions that are generated by the same unit.

The process of understanding the problem also continues in this process. While students generate different ideas which is a creative act, students also evaluate once a design alternative is generated. This shows how learning and generating new ideas are also intertwined in design studios. In most formal learning settings, learning proceeds from learning the generic, verbal, declarative knowledge to turning that knowledge into procedural skills [24]. In such instances, comprehension precedes production [25] but in areas where learning without awareness (implicit learning) dominates the learning process as in design learning, comprehension and making go together [26].

The exercise encourages such process where students can seamlessly generate and test new ideas as well as learning from them. Students explore alternatives by already generated initial units with its variations easily instead of drawing a nine-square separately. This hands-on approach (see Figure 2) enables the students explore relations betweens elements by making and recognizing new shapes, by looking for alignments between the units.

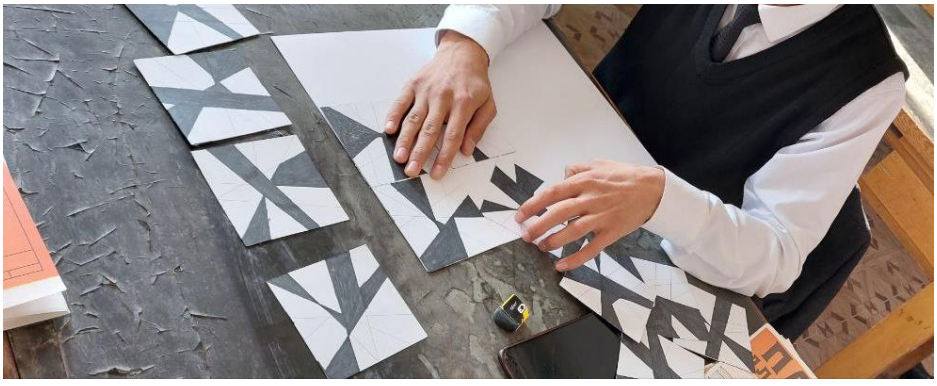

Figure 2. Hands-on approach for generating 9-square compositions.

2.3. The Second Phase (GE)

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In the second phase, the students are provided with a composition by a well-known artist and educator Laszlo Moholy-Nagy. In this phase, students started to design the initial 'axa' unit by analyzing the precedents they selected. The analysis process is structured as two successive tasks. The first task was to make a visual list of shapes they can recognize and identify (see Figure 3). The second task was to understand how these shapes were brought together as a composition. After these two tasks, they were asked to select three shapes from the visual list that they produced to use in their new design for the initial 'axa' unit.

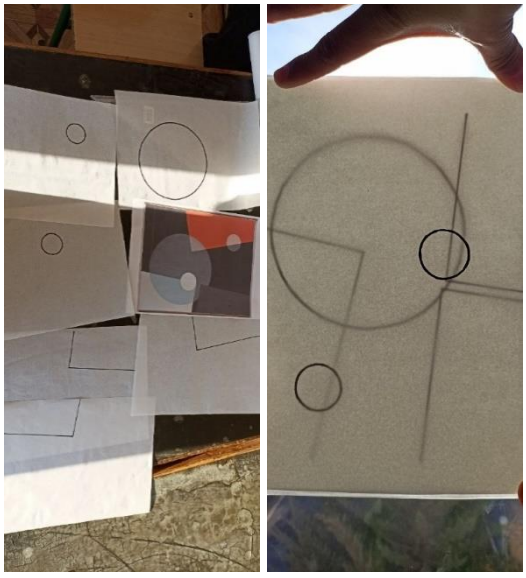

Figure 3. Analysis of precedents. Identifying the components of a composition.

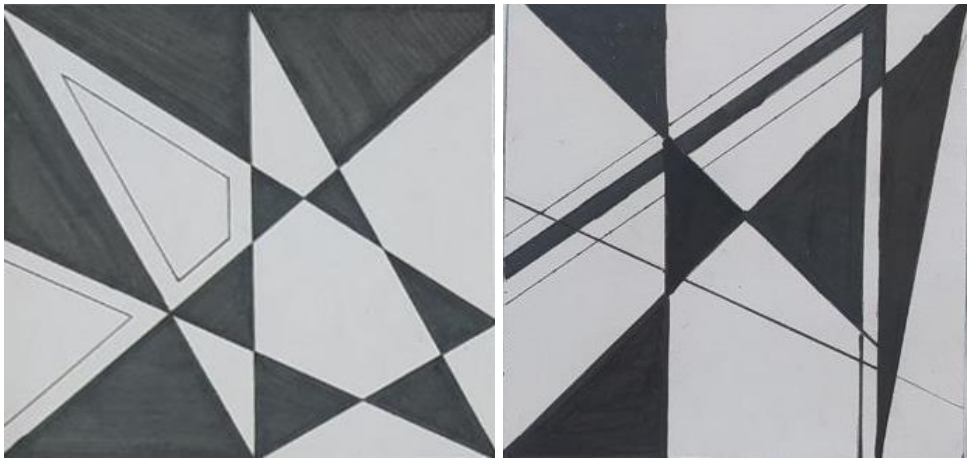

Figure 4. Initial units "axa" for nine square compositions from the second phase.

There are two prominent differences when a comparison is made between the initial units that are produced in the first phase and the second phase (see Figure1a and Figure 4). Firstly, the number of shapes and types of shapes are increased. This means that the students are able to integrate and deal with more elements when they are making new designs. Secondly, the relations between the elements are more varied and more complex when the initial units from the first and second phase. The students discovered that the shapes that they use can be brought together in different positions. They started embedding the shapes in use in different sizes and ways.

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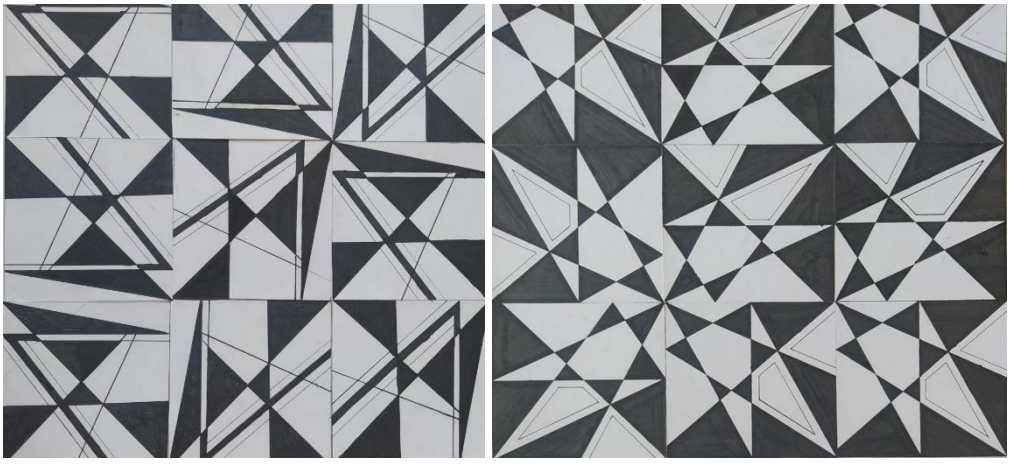

Figure 5. Nine square compositions from the second phase generated by the initial ‘axa’ units shown in Figure 4.

3. On Design Learning and Students’ Creative Performance

Learning by doing can foster implicit learning however any education in a domain aims for an explicitness of what is learnt. Some mixture of instruction and experience should be included to be able to acquire design expertise. Finding ways to exercise divergent and convergent thinking with a consideration of creating opportunities for interaction between implicit and explicit forms of learning is necessary in design studios.

Design studio education, on the other hand, heavily relies on individual experience to acquire knowledge. The student must begin to design before he/she knows what he/she is doing, so that the studio master’s demonstrations and descriptions can take on meanings useful to his/her further designing. Using Meno paradox, Schön [27] states that design activity is to look for something without knowing what it is. According to Schön [27], design cannot be defined exhaustively and to teach a student what design is becomes impossible through conventional methods of teaching which follow the premises of conduit metaphor [28]. Instead, Schön [27] proposes that it is possible to coach students by quoting Dewey:

He has to see on his own behalf and in his own way the relations between means and methods employed and results achieved. Nobody else can see for him, and he can’t see just by being told, although the right kind of telling may guide his seeing and thus help him see what he needs to see. [29, p. 151]

The first phase was to accommodate such individual exploration. In the second phase, the students’ creative performance was increased in terms of the number of elements used and the complexity of their compositions. This shows that further instructions seem to be more meaningful or have an impact on the learner’s performance once the learner’s familiarity with the design problem at hand increases. The exercises as a connected series of activities enable successive refinement by allowing repetition, by providing opportunities to make and correct errors, and by providing informative feedback to the learner [30].

The series of exercises is structured as two phases to direct the students through divergent and convergent thinking as the problem is kept the same in both phases. While it is well-established in design literature that design problems are complex and involve both insight and incremental problem solving, that is, both divergent and convergent thinking, the shifts between divergent and convergent thinking are

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also seen as necessary [31][32][33][34][35][36][37]. Novices' conception of creativity and design lacks a number of key aspects of the nature of design [38]. They tend to think that design processes are linear. They tend to end the process with the first idea they come up with. The FE-GE strategy offers ways to overcome such misconceptions by providing individual experiences. The first phase emphasizes and supports convergent thinking as it is already embedded in the exercise. The second phase introduced two things to the students. One is that there can be another solution to a design problem they have already dealt with. This emphasizes the divergent thinking aspect of creative thinking in design. Second, it is possible to learn from other creative products that were produced in the past. This aspect of this pedagogical strategy accommodates the conception of creativity that values establishing a linkage between current and past in the development of creative products.

The pedagogical strategy presented provides support for the implicit nature of design learning as well as creating opportunities for more explicit interventions during the learning process while it also has the potential for offering ways to include various aspects of different conceptions of creativity into the content of design studios.

Further Studies

The studio experience in SamDAQU brought forward the importance of cultural aspects on the conception of creativity. In the light of the studies reviewed, the need for conducting a study that investigates and explores in what ways the conception of creativity in Central Asia countries is similar to or different than the countries studied before.

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