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Research Article

"SCAMPER" AS A SUPPORTIVE MODEL FOR TRANSFERRING DESIGN STUDIO LEARNING OUTCOMES

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Abstract In architectural education, when examining the curricula of architectural design studios, one can observe the learning outcomes that learners are expected to achieve. The learning outcomes intended to be achieved in architectural design studios may vary in their transfer to practice, depending on the teacher. This variability in transfer can lead to learners not fully acquiring the desired 'awareness, understanding, and skills'. With the increasing number of architecture schools today, these problems are becoming more prominent. To address these issues, a supportive teaching model, utilizing the "SCAMPER" applications, is proposed. This approach aims to enhance learners understanding and ability to generate diverse solutions to contemporary problems by actively utilizing and experiencing the learning outcomes acquired through traditional teaching models. The study focuses on the sustainability of learning outcomes in architectural design studios and the potential of the "SCAMPER" applications to improve the design process.

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Introduction

The backbone of an architectural education aimed at preparing individuals for the profession the learning outcomes to be taught each semester in architectural design studios. Learners who revisit and re-learn the learning outcomes of the previous semester throughout their educational journey will contribute to a deeper understanding that will enable them to find creative solutions to current problems. However, the repetition of learning outcomes from the previous semester is often prevented by operational differences and constraints such as time limitations. In such cases, the intended learning outcomes tend to be underemphasized and forgotten each semester.

Studying architecture involves a process with different learning outcomes. This process unfolds vertically over four years and horizontally through complementary studies each semester. With different learning outcomes expected for each semester, each stage of studio work should be assessed as a sequential and related instructional effort. Architectural design studios are integral to the approach and structure of undergraduate architectural programs (Özdamar&Goudarzi, 2021, pp. 67-81), which create a system characterized by progressive horizontal and vertical supervision. In this context, for the learner to effectively assimilate knowledge, the repetition of previously imparted learning outcomes in the vertical dimension of the four-year design process is crucial. This approach is considered essential to ensure that the learning outcomes, which include both knowledge and skills the learners are expected to acquire during their education, can be sustained.

A supportive teaching model that facilitates the transmission of intended learning outcomes within the learner-teacher dialog is needed in architectural design studios. In order to support the sustainability of the knowledge and skills of the learners, the “SCAMPER” applications, derived from the “SCAMPER TECHNIQUE”, are linked to the synthesis stage in the horizontal dimension of the design process. In this context, learning outcomes are divided into knowledge-based and skill-based categories when designing a supportive teaching model for architectural design studios. Knowledge-based learning outcomes imply that the learner acquires a different set of knowledge horizontally from semester to semester, while skill-based learning outcomes imply that the same set of skills is developed and reinforced vertically from semester to semester.

Architectural Design Studio Learning Outcomes

Learning outcomes are statements that describe what a learner should know, understand, and be able to do at the end of a learning period (Donnelly & Fitzmaurice, 2005). In the Architectural Design Studio, the learning outcomes targeted in the four-year curriculum are expressed in terms defined in the European Qualifications Framework (EQF). These outcomes describe the learner's acquisition of knowledge, understanding, skills, and competencies at the end of the learning process. Learning outcomes refer to the knowledge, skills, and competencies that an individual possesses after completing a learning process, according to the Regulation on the Implementation Principles and Procedures of the Turkish Qualifications Framework (TQF). For

higher education, learning outcomes indicate what a person can know, do, and be able to do after successfully completing a higher education program.

Each discipline's undergraduate educational environment is an academic venue where learners acquire basic architectural planning and design sensibilities, knowledge, skills and abilities. It is a space where, through interactive academic dialogue, alternative design options are developed by employing the dialectical thinking inherent to these disciplines. It is an environment where the fundamental characteristics of these disciplines, such as the basic knowledge and skills of design sensitivity and awareness, are combined with other information that facilitates their professionalization. It is in this environment that the products of the discipline will be produced, and the learning outcomes will be tested. Architectural Planning and Design Studios (Council of Higher Education-CHE) collectively form this environment.

Knowledge and skill-based learning outcomes have been developed by institutions such as the National Architectural Accrediting Board (NAAB), the Royal Institute of British Architects (RIBA), and the Association for Accreditation of Architectural Education (MIAK). These accrediting bodies were selected because of NAAB's integration with the United States in the professional education process, RIBA's integration with the United Kingdom, and MIAK's role in determining professional competence at the national level. NAAB has established Student Performance Criteria (SPC). These SPCs define the knowledge and skills that architecture students must acquire. In the accreditation procedures, most recently updated in May 2015, the Student Performance Criteria are divided into four areas:

1. Critical Thinking and Presentation: Obtaining a well-rounded education that values lifelong curiosity, communicates using a variety of graphic tools, evaluates evidence, understands people, environment, and context, and recognizes the diverse needs of clients, communities and society.
2. Building Practices, Technical Skills and Knowledge: Designing buildings with well-integrated systems, understanding feasibility, integrating principles of environmental stewardship, effectively communicating technical knowledge.
3. Integrated Architectural Solutions: Synthesize variables from diverse and complex systems into an integrated architectural solution, require environmental stewardship in an integrated solution, evaluate options, balance the impact of design decisions across systems and scales.
4. Professional Practice: Understand architecture and building industry, distinguish valuable roles and major players in related fields, understand legal and professional responsibility and professional ethics. Each school is free to develop its own approach to achieving the goal of teaching these identified knowledge and skills (Tatar, 2015).

Within the standards, the Royal Institute of British Architects (RIBA), with a particular focus on the knowledge, skills and understanding that students need to acquire, highlights 11 general criteria that architecture programs will refer to in developing their pedagogical interpretations:

1. The ability to produce architectural designs that meet aesthetic and technical requirements,

2. A broad knowledge of the history and theory of architecture and of related arts, technologies, and human sciences,
3. Understanding the fine arts as they relate to architectural design,
4. Adequate understanding of urbanism, planning processes and planning competencies,
5. An understanding of the relationship between people and structure, between structure and environment, between related spaces, and between human needs at different scales,
6. An understanding of the profession of architecture and of the role of the architect in society, with a preliminary knowledge of social factors,
7. Understanding of methods of research and preparation of information in design projects,
8. Understanding of structural design in relation to building design, structural and engineering problems,
9. Understand the physical issues, technologies and functions of buildings that are necessary to ensure the conditions of comfort and protection of the indoor climate,
10. The design skills necessary to meet the needs of the users of the building within the constraints of economic factors and building codes,
11. Appropriate knowledge encompassing the translation of design concepts into buildings. This includes the combination of plans with comprehensive planning involving industries, organizations, regulations and procedures. As a general approach, it is intended that the method of achievement of the target knowledge and skills will be different from institution to institution (Tatar, 2015).

The knowledge, skills and competence areas that graduates should acquire are categorized under five main headings according to the accreditation conditions of MIAK:

1. Architecture-Design/Creative Thinking: Critical thinking skills, communication skills, research skills, design skills,
2. Architecture-History/Theory, Culture/Art: Understanding of global architecture, understanding of local architecture/cultural diversity, understanding of cultural heritage and preservation,
3. Architecture-Environment/City/Society: Sustainability skills, understanding of social responsibility, understanding of nature and humanity, understanding of geographical conditions,
4. Architecture-Technology: Understanding of life safety, structural systems, building physics, environmental systems, building materials and applications, building systems integration skills,
5. Architecture-Professional Environment: Programming and evaluation skills, comprehensive project development, understanding of construction costs and architect-client relationships, teamwork, project management, practice management, leadership, understanding of legal rights and responsibilities, understanding of professional ethics. (Tatar, 2015).

These knowledge and skill-based learning outcomes are repeated and reinforced throughout the horizontal dimension of the educational process. In this context, the knowledge-based outcomes contribute to the preparation of the “SCAMPER” questions for the applications, while

the skill-based outcomes play a role in determining the success criteria of the “SCAMPER” applications and in assessing the efficiency of the implementation process, which are:

1. Knowledge of basic design,
2. Understanding of society/user needs,
3. Knowledge of history/theory,
4. Knowledge of culture/art,
5. Urban design/environmental knowledge,
6. Sustainability knowledge,
7. Building/construction knowledge,
8. Professional practice knowledge.

To reinforce knowledge-based learning outcomes, it’s important to separate and examine each one based on its topics and principles.

Skills-based learning outcomes include:

1. Critical and creative thinking,
2. Communication skills,
3. Research skills,
4. Design skills,
5. Multidisciplinary working skills,
6. Ability to think multi-dimensionally,
7. Ability to develop sustainable solutions to contemporary problems.

Skills-based learning outcomes are learning achievements that are repeated throughout the vertical dimension of the educational journey in each semester.

In this context, knowledge-based learning outcomes help to prepare “SCAMPER” questions for “SCAMPER” applications, while skill-based learning outcomes help to determine the success criteria for “SCAMPER” applications and to evaluate whether the implementation process is efficient or not.

“Scamper Technique” Teaching Model

The “SCAMPER TECHNIQUE” is the brainchild of Bob Eberle and was developed in 1971. The acronym “SCAMPER” is derived from the first letters of the steps that make up the technique. These steps are structured to develop creative problem-solving skills in both learners and teachers. Through these steps, brainstorming fosters the generation of diverse ideas around a given object or concept. According to Michalko (2006), each idea generated is the basis for another idea. According to Gann (2014), this technique, which is fun for both learners and teachers, is very important in developing creative thinking (Aydın & Çilci, 2020, pp. 223-262).

The steps of the “SCAMPER TECHNIQUE” are outlined below:

S - Substitution: The goal of this step is to generate alternative design sketches/ideas in place of the produced design sketch/idea. The basic question is: “What else can I produce in place of the design sketch/idea?”

C - Combine: This step aims to create a new design sketch/idea by combining different ideas/principles. The basic question is: “What other ideas/principles can I combine?”

A - Adapt/Adjust: This letter aims to make certain changes in the design sketch by adapting previous ideas to fit the current situation. The basic question is: “How can I differentiate the design sketch to adapt to changing conditions?”

M - Modify/Minimize/Magnify: This letter aims to make changes such as enlarging, reducing, or modifying the original form to produce an original design sketch. The basic question is: “By enlarging/reducing/modifying certain aspects in the design sketch, how can I get a different and unique idea?”

P - Put the Other Uses: This letter aims to use the principles that make up the design sketch in ways that go beyond their regular purposes. The basic question is: “Can I use the principles from my design sketch somewhere else? Where and how can I use them?”

E - Eliminate: This letter aims to improve the design sketch by removing some principles or forms from the system to make it more beautiful, successful, useful, etc. The basic question is: “Are there other things I can remove from the principles/forms to make the design sketch better?”

R - Reverse/Rearrange: The purpose of this letter is to consider alternative outcomes, applications, and ideas by rearranging the design sketch. Principles within the design sketch can be rearranged or the form can be reversed. The basic question is: “Are there other things I can reverse or rearrange from the original design sketch?”

The “SCAMPER TECHNIQUE” can be used by applying all letters (from S to R) in different examples and topics, or it can be implemented by using all letters in a particular question/problem or topic (Özyaprak, 2016, pp. 67-85). For example, students can be given a known narrative and asked to differentiate all the elements of this narrative (space, time, characters, events, etc.) using all the letters of “SCAMPER” to create their original narratives.

In this aim the points to consider for “SCAMPER” applications are:

- The number of students should not exceed 10-15, but this number can be increased depending on the students’ familiarity with the technique,
- Students must be informed about the technique and practice should be conducted prior to application (Howard-Jones, 2002, pp. 215-226),
- In the application of the “SCAMPER” steps, when working with an object, preliminary work related to the use and introduction of the object should be carried out prior to the application (Eberle, 1996),
- Unusual and different questions are always interesting; attention should be paid to making the prepared questions interesting (Eberle, 1996),
- Students should be encouraged to think by asking questions such as “What else could be there? What else could be used? What else could be added? How else could it be changed?” (Weisberg, 2006),

- During the applications, students should be allowed to express their thoughts freely (Toraman & Altun, 2013, pp. 166-185),
- Students should be given quiet time to internalize their thoughts,
- During “SCAMPER” applications, ideas should be appreciated and noted if necessary; each idea expressed should be evaluated (Roger, 2011),
- Negative or mocking criticism of opinions should not be made. However, acceptable jokes should be used when appropriate, as humor adds to the fun aspect of the technique,
- During or after “SCAMPER”, drawings should never be limited. The important thing is not to make beautiful drawings, but to reflect thoughts through drawings,
- The teacher should show enthusiasm and excitement during the applications (Gladding, 2011, pp. 1-7),
- Different “SCAMPER” sessions should not be conducted consecutively in a single day. “SCAMPER” sessions should be conducted at different times of the week,
- Questions should be formulated according to the level of the group,
- Individual applications should be implemented as a result of group research conducted collectively (Baş, 2018).

In architectural education, in architectural design studios that include the horizontal and vertical dimensions of the design process, it is necessary to encourage learners to ask questions in order to generate alternative ideas. Questions activate learners existing knowledge, increasing their learning capacity and the likelihood of acquiring new knowledge. Acquired knowledge is transformed into skill-requiring actions that trigger the emergence of new questions. It’s important for learners to understand the subject matter with their own answers, while the teacher should ask guiding questions to direct the learner. In this context, this study presents a narrative where questions prepared using the “SCAMPER TECHNIQUE”, related to learning outcomes targeted in the vertical dimension of design, are used in dialogues between the learner and teacher in the synthesis process, which is in the horizontal dimension of design.

In this context, the study presents a narrative in which questions prepared using the “SCAMPER TECHNIQUE” related to targeted knowledge-based learning outcomes are utilized in the dialogue between the learner and teacher during the synthesis process in the horizontal dimension of design.

Architectural Design Studios Design Processes

The backbone of design education is the architectural design studio, which serves as the primary course where the design process unfolds. In Turkey, in all universities, architectural design studios are structured in two dimensions: horizontal and vertical, within the four-year curriculum. Consequently, each studio, from the first to the fourth year, intensifies in content vertically, allowing the learner to transfer the accumulated design knowledge to the following year. Meanwhile, a semester-long studio content represents a horizontal dimension, functioning as a practical platform for acquiring, analyzing, synthesizing, and evaluating design knowledge and skills.

Asimow (1962) defines design as a cyclical process that progresses over time through iterative actions. Asimow divides the design process into two dimensions: the horizontal dimension and the vertical dimension.

1. Horizontal Dimension: It's a cyclical process that includes stages of information gathering, analysis, synthesis, evaluation, and application, and takes about 16 weeks within a design semester in architectural design studios.
2. Vertical Dimension: It denotes the sequential structure of design studios conducted over a four-year curriculum, with each term building on the accomplishments of the previous term.

It is shown in the table below within the framework of the Architectural Project Course in the Course Information Package of the Department of Architecture of Karadeniz Technical University (KTU, Trabzon, Türkiye) where the detailed course content process of design is carried out in architectural design studios for long periods of time in architectural education (URL 1).

Table 1. Architectural Design Studio Course Process.

Week 1	Announcement of project topics; preliminary information and discussions
Week 2	Gathering and sharing information about the subject.
Week 3	Gathering and sharing information about the subject; obtaining the program.
Week 4	Site visitation; describing and conducting analyses of the location.
Week 5	Initial sketches; discussions on ideas and concepts.
Week 6	Generation of alternative solutions.
Week 7	Selection of an alternative for development based on various criteria.
Week 8	Development stage
Week 9	Mid-semester study
Week 10	Overcoming structural issues
Week 11	Review of the project in terms of installations (water, electricity, heating, ventilation, sewage, and security).
Week 12	Development of the project's sections and elevations.
Week 13	Changing the scale of the project and reviewing all functional, structural, and other issues on a larger scale.
Week 14	Material, color, and texture revisions.
Week 15	Informing and discussing presentation methods and techniques.
Week 16	It is in the form of an end-of-term exam.

If we sum up the course processes that form the horizontal dimension of the design process, in order to transfer to the learner, the intended learning outcome in each period within the four-year curriculum in Architectural Design Studios, the design process is:

1. Information Gathering: Gathering and sharing information about the topic,
2. Analysis: Reviewing a sample project, creating a functional diagram, determining the needs program, studying the site,
3. Synthesis: Generation and development of initial ideas, elimination of structural problems, material, color and texture corrections,

4. Evaluation: The presentation of the final product.

The horizontal dimension of the design process for a semester is planned with one and a half weeks for knowledge acquisition, one and a half weeks for analysis, ten weeks for synthesis and two weeks for evaluation. Since the synthesis phase lasts for ten weeks, it is considered to be the most comprehensive stage of the semester. Therefore, it is critical to implement a supportive instructional model that comprehensively addresses this phase in order to reinforce the desired learning outcomes. “SCAMPER” applications can be implemented by structuring the 16-week design process of architectural design studios, consisting of knowledge acquisition, analysis, synthesis, and evaluation stages, proportionally into 2 days each.

“Scamper” Applications for Architectural Design Studios

In architectural design studios, it is believed that the knowledge and skills acquired over the course of a semester through the traditional instructional model can be sustained in the horizontal dimension of the design process by repeating and incorporating them into “SCAMPER” applications.

The “SCAMPER” applications are structured using a design-based research methodology. The steps of the design-based research method are adapted to the “SCAMPER” applications as follows: problem definition, theoretical investigation of the problem, structuring of the “SCAMPER” applications, implementation, and evaluation of the results. If we structure the “SCAMPER” applications according to these steps, the steps are:

1. Identification of the problem when we structure the “SCAMPER” applications according to these steps; the lack of repetition of knowledge-based learning outcomes in the vertical dimension of education in architectural training may lead to the inability of the learner to maintain knowledge and skills,
2. Theoretical study of the problem, determination of the knowledge-based learning outcomes that should be transferred in each semester,
3. Structure the “SCAMPER” exercises, prepare the “SCAMPER” questions based on the knowledge-based learning outcomes, determine the subject areas and participants, create the “SCAMPER” exercise schedule, prepare the informative presentation on the “SCAMPER” technique, and select relevant example projects to acquaint participants with the “SCAMPER” exercises,
4. Implementation of the “SCAMPER” applications during the horizontal dimension of the training, which lasts one semester and is focused on the synthesis stage, the generation of alternative ideas using the “SCAMPER” technique,
5. The evaluation of the results of the “SCAMPER” applications will conclude the conclusion of the application process through the measurement of whether there has been a change in the learner’s knowledge and skills,

“SCAMPER” applications are initially structured after the identification and theoretical study of a problem. The following sections present a sample “SCAMPER” application design.

Preparation of "SCAMPER" Questions Based on Knowledge-Based Learning Outcome Topics

In structuring "SCAMPER" applications, it is essential to first determine the topic of the knowledge-based learning outcome that is to be reinforced. The content of the courses listed in the department's course information packages can be used to determine the learning outcomes. The course content articulates the goals and objectives of the course and identifies the topics of the targeted learning outcomes. In addition, the topics corresponding to each week are indicated in the weekly schedules. A "SCAMPER" application can be used to reinforce the material before moving on to the next topic after the traditional methods have been used to cover the topics.

When developing a sample "SCAMPER" application "SCAMPER" application, the learning outcome of "Knowing Fundamental Design Knowledge," intended to be taught in the first year of architectural design studios, can be selected because it is a knowledge-based learning outcome that should be reinforced each semester in the vertical dimension of the design process. Therefore, in order to determine the topics and principles of the learning outcome "Knowing Basic Design Knowledge," it is essential to review the content of courses related to basic design in the first-year course information package of the architectural departments. For example, in the course information package of the basic design course at Department of Architecture of Karadeniz Technical University (KTU, Trabzon, Türkiye), the contents include studies on visual communication and perception in visual arts, shape-ground relationship, space, form and geometry, space in architecture, design elements (line, direction, scale, texture, shape, color, value), and design principles such as harmony, contrast, proportion, unity, dominance, and balance in two- and three-dimensional compositions.

One of the fundamental topics observed is "Basic Design Elements and Principles" when examining the content related to 'Basic Design Knowledge. Therefore, in order to repeat and support the permanence of the learning outcome "Knowing Fundamental Design Knowledge," "SCAMPER" questions can be prepared based on the topic of "Basic Design Elements and Principles." In addition, questions can be formulated and applied by identifying the principles from other topics.

Accurate preparation of "SCAMPER" questions is a crucial aspect of an effective "SCAMPER" application. Students need "SCAMPER" questions to generate numerous alternative design sketches through the "SCAMPER" application based on their initial design sketches created during independent work activities.

For "SCAMPER" applications prepared in accordance with the "Know Basic Design Knowledge" learning outcome, it is essential to thoroughly review the topic of "Basic Design Elements and Principles" when preparing "SCAMPER" questions. Design elements encompass point, line, shape, space, scale, proportion, texture, and color, while design principles include proportion, dominance, balance, unity, repetition, harmony, and contrast. In architectural design studios, the scales where "basic design elements and principles" are most commonly used in designs are site plans and elevations. Other applied design departments

can determine the scales at which the Basic Design Elements and Principles are most commonly used in their studio courses.

The Participants and Defining the Workspace

The identification of participants for “SCAMPER” applications should be based on the assumption that the participants have achieved the targeted learning outcome due to the prerequisite knowledge of the “SCAMPER TECHNIQUE”. It is expected that participants will have completed their first year of architectural education and will be familiar with the culture of architectural education for “SCAMPER” applications structured around the learning outcome topic of “Basic Design Elements and Principles” in the first year of architectural education. This will ensure that “SCAMPER” applications can be carried out in a more practical and easier way. Of course, in the second, third and fourth years of architectural education, “SCAMPER” applications can be implemented.

It is important to choose a scale (plan, floor plan, section, elevation) and location that is appropriate to the topic of the desired learning outcome when determining the workspace for “SCAMPER” applications. Selecting a location that is appropriate for these scales is critical to the effective implementation of “SCAMPER” applications, as the scale for “Basic Design Elements and Principles” is primarily site plans and elevations.

Preparation of the “SCAMPER” Application Program

The “SCAMPER” application program is designed for a maximum of 10 to 15 participants in the horizontal dimension of the architectural design studios, and spans a process of 16 hours, which is equivalent to four sessions. This process can be implemented within a semester at the end of each topic to reinforce concepts, or at the beginning or end of a semester to reinforce learning outcomes that have already been covered. Since first-year students may be unfamiliar with studio culture, “SCAMPER” applications tailored to the “Knowing Fundamental Design Knowledge” learning outcome may be more appropriate for implementation at the beginning of the next year.

During the knowledge acquisition stage of the horizontal dimension of the design process, the students will recall their existing knowledge about the subject matter of the previous learning outcomes. This helps participants to recall and warm up to the topic before engaging in the design process.

In this phase, students will examine sample projects and sites and perform the required analysis as part of targeted learning outcomes. Additionally, if deemed necessary, participants will be asked to create functional diagrams and requirements programs. In this way, the first 4-hour session of the workshop, which corresponds to the horizontal dimension of the design process, is completed with the knowledge acquisition and analysis phases.

For the synthesis, the student will create an initial design sketch within the scope of the assignment. This process covers the 4th to 6th hours of the program.

In order to facilitate the implementation of “SCAMPER” applications, it is necessary to briefly introduce the “SCAMPER TECHNİQUE” to the participants during the same session. After the

introduction of the “SCAMPER TECHNİQUE”, participants are asked to generate alternative design sketches by asking “SCAMPER” questions related to the target learning outcome and the selected sample projects.

In the “SCAMPER” applications prepared for the Design Fundamentals learning outcome, after identifying the Design Fundamentals elements and principles in the site plan/elevation views of selected sample projects, subsequently, they generate alternative design sketches by posing “SCAMPER” questions.

As the synthesis phase continues, participants are tasked with generate alternative design sketches by asking “SCAMPER” questions based on the initial design sketches they generated while working freely. A significant number of sketches are generated while trying to answer all the “SCAMPER” questions. The third and fourth sessions, from hours 8 to 16, complete the “SCAMPER” application.

All sketches produced throughout the workshop will be submitted in the specified format, and the workshop process will conclude with a hearing of the participants’ opinions about the process. This also completes the design evaluation phase in the horizontal dimension.

Preparing an Informational Presentation on the “SCAMPER TECHNİQUE”

In order for the participants to be able to carry out the applications, they must be informed about the “SCAMPER TECHNIQUE” beforehand. Thinking exercises using “SCAMPER” questions with some buildings are conducted after a short presentation.

Selection of Relevant Sample Projects For The Implementation of “SCAMPER” Applications

When selection of sample projects for the construction of “SCAMPER” applications, they should be related to the subject matter and the scope of the targeted knowledge-based learning outcome. The participants will ask the “SCAMPER” questions to the sample projects within the framework of the targeted knowledge-based learning outcome.

Generating Alternative Ideas With The “SCAMPER” Application

Through the free work activity, participants should generate alternative design sketches by asking “SCAMPER” questions that reinforce the themes of the targeted knowledge-based learning outcomes.

Students should be asked to identify the “Basic Design Elements and Principles” they used in their initial design sketches during the synthesis phase in the “SCAMPER” applications, prepared for the “Understanding Basic Design” learning outcome. Subsequently, a large number of alternative design sketches will be rapidly generated while using “SCAMPER” and searching for answers to “SCAMPER” questions. At the conclusion of the synthesis phase, the evaluation phase should be as a discussion with participants about whether there have been any changes in their knowledge and skills throughout the application process.

Conclusions

In recent years, with the advancement of technology and changing needs, questions of how to deliver architectural education have gained prominence. “SCAMPER” applications are expected to contribute to the sustainability of the knowledge and skills acquired by students in the search for alternative teaching models in architectural design studios, which are the backbone of architectural education. Models will be developed to support traditional teaching methods in this context. The “SCAMPER TECHNIQUE”, within the framework of the teaching model, responds to the search for supportive models.

“SCAMPER” applications in the architectural design studio can be organized within the vertical curricular sequence that spans a term, reminding students at the beginning of a new term of what they have learned in the previous term or reinforcing what they have learned through traditional methods at the end of the term. “SCAMPER” applications can be implemented immediately after the subject has been taught by identifying the themes and principles of the targeted knowledge-based learning outcomes, without having to move on to another subject. In addition, these applications are 16 hours in length. Therefore, they can be scheduled as a weekend workshop within the semester. Thus, “SCAMPER” applications can be implemented at the beginning, middle and end of the semester. In this way, the desired knowledge-based learning outcomes in architectural design studios are quickly revisited and reinforced by the learners.

The “SCAMPER” applications can serve as a model that can be useful in other applied design education such as graphic design, industrial design, fashion design, environmental design, etc. For this purpose, in applied design education, it is necessary to separate the target learning outcomes for each semester into knowledge-based and skill-based, determine the topics and principles of knowledge-based learning outcomes, and prepare corresponding “SCAMPER” questions. After that, a “SCAMPER” application program will have been created and the learners will have been introduced to the “SCAMPER” applications with a short presentation on the “SCAMPER TECHNIQUE”, which will allow them to reinforce their knowledge-based learning outcomes.

The key to success in this application is for the teacher to be knowledgeable about the subject matter of the targeted learning outcomes and to properly guide the learners by asking appropriate “SCAMPER” questions. The right questions are the key to getting students to recognize, understand, and transform knowledge into competence as they search for the right answer. With “SCAMPER” applications, the goal is not to find the right answers, but to create a free and flexible environment for creative thinking practice. It helps students to recall the knowledge they already have and thus use their skills to achieve an outcome. Having used “SCAMPER”, learners acquire the ability to derive other creative solutions to current problems by generating their own “SCAMPER” questions throughout their educational and professional life.

After using “SCAMPER”, it is expected that the learner will be able to;

- Develop critical and creative thinking skills and the ability to ask questions,

- Enhance the ability to design and communicate in a flexible and open working environment,
- Think through “SCAMPER” questions while analyzing samples to improve research skills,
- Actively participate in group work environments to cultivate multidisciplinary work skills,
- Gain ability to provide sustainable solutions to contemporary issues,
- Enhance the ability to think multi-dimensionally by having the opportunity to reinforce previously learned but potentially forgotten learning outcomes in subsequent periods.

“SCAMPER” applications provide the teacher with a hands-on approach to the transfer of targeted learning outcomes. The teacher can make the process more efficient and faster by planning and preparing the structure and questions of “SCAMPER” applications in advance. This allows the teacher to quickly review and reinforce each of the targeted knowledge-based learning outcomes with “SCAMPER” applications shortly after they have been covered.

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CHE: Council of Higher Education

EQF: European Qualifications Framework

MIAK: Association for Accreditation of Architectural Education

NAAB: National Architectural Accrediting Board

RIBA: Royal Institute of British Architects

TQF: Turkish Qualifications Framework