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12

INFLUENCE OF ARCHITECTURAL DESIGN TRENDS ON THE FORMATION OF STUDENT TRAINING PROGRAMS

INFLUENCIA DE LAS TENDENCIAS DEL DISEÑO ARQUITECTÓNICO EN LA FORMACIÓN DE LOS ESTUDIANTES

Alexander Prishchepa[1*]
E-mail: cafdidpi@mail.ru
ORCID: https://orcid.org/0000-0002-0104-3198
Lyudmila Burovkina[2]
E-mail: burovkinala@yandex.ru
ORCID: https://orcid.org/0000-0001-9775-2206
Marina Pavlova[1]
E-mail: minka67@yandex.ru
ORCID: https://orcid.org/0009-0006-3028-8641
Sergey Ignatyev[2]
E-mail: ise_hgf@mail.ru
ORCID: https://orcid.org/0000-0002-2430-3984
Alla Ignatyeva[2]
E-mail: all-ignateva@yandex.ru
ORCID: https://orcid.org/0000-0001-7772-5219
[1] Don State Technical University, Russia.
[2] Moscow City University, Russia.
*Corresponding autor

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ABSTRACT

This article aims to analyze the impact of emerging architectural trends on educational strategies and curricula. The study uses a qualitative research approach, including a review of current literature on architectural trends and pedagogical methods. The authors examine new concepts of the development of architectural space, design, and visual communications to identify significant areas. The article emphasizes the need to study design trends to achieve a high level of professional culture among students and the results that meet the modern requirements of society for specialists. The article identifies key areas requiring curriculum updates, including the incorporation of digital modeling tools, sustainable design principles, and space-oriented architectural solutions. The study shows a significant gap in current educational practices regarding the preparation of students for challenges of ecological sustainability in urban design.

Keywords:

Architecture, education, design, safety, pedagogical methods, navigation.

RESUMEN

Este artículo pretende analizar el impacto de las nuevas tendencias arquitectónicas en las estrategias educativas y los planes de estudios. El estudio utiliza un enfoque de investigación cualitativa, que incluye una revisión de la bibliografía actual sobre tendencias arquitectónicas y métodos pedagógicos. Los autores examinan los nuevos conceptos del desarrollo del espacio arquitectónico, el diseño y las comunicaciones visuales para identificar áreas significativas. El artículo hace hincapié en la necesidad de estudiar las tendencias del diseño para lograr un alto nivel de cultura profesional entre los estudiantes y unos resultados que satisfagan los requisitos modernos de la sociedad en cuanto a especialistas. El artículo identifica áreas clave que requieren actualizaciones curriculares, como la incorporación de herramientas de modelado digital, principios de diseño sostenible y soluciones arquitectónicas orientadas al espacio. El estudio muestra una importante laguna en las prácticas educativas actuales en lo que respecta a la preparación de los estudiantes para los retos de la sostenibilidad ecológica en el diseño urbano.

Palabras clave:

Arquitectura, educación, diseño, seguridad, métodos pedagógicos, navegación.

INTRODUCTION

The current stage of technological development and the comprehensive expansion of the environment on Earth and in space require architects, designers, and engineers to create new systems and concepts for architectural development. In the context of rapid technological advances and increasingly complex global challenges, the education of new architecture and design specialists is of paramount importance. Architects and designers are crucial in addressing urbanization, sustainability, and technological integration (Prishchepa & Burovkina, 2022a; Prishchepa & Burovkina, 2022b).

Everything built under the conditions of Earth's functioning as a celestial body, physical and dynamic impacts, magnitudes of vibrations, gravity, and much more is becoming a thing of the past. Futuristic architecture operates with new parameters created by the universe and thinks in new theoretical and practical categories of ideation and artistic and figurative embodiment of environmental objects.

According to Prishchepa (2013), notes, "creativity is based on the characteristics of any environmental object or system that synthesizes in a single process the spatial structure, individual qualities, modes of functioning that form the environment with a comprehensive consideration of consumer requirements aimed at the specifics of life and environment". (p. 57)

The development of new environmental zones requires complex solutions and interaction of creative teams (technologists, engineers, designers, architects, designers, and many others). Futuristic architecture requires not rethinking life, but rather a new life (Lavrentiev et al., 2015). This refers to life as an integral process of social development. Architecture needs to be understood as a factor in the formation of a new consciousness with due regard to new living conditions. The education of architects and designers is crucial in this context.

Educational programs should include the latest trends in space planning and visual communications. This evolution should be combined with a rigorous understanding of advanced technologies and sustainable practices. Thus, students will be more prepared to meet contemporary social demands and contribute to the field.

The comprehensive analysis of current architectural education programs, emerging industry trends, and expert opinions shows critical areas where educational practices must evolve. By examining the integration of modern technologies, sustainability principles, and interdisciplinary approaches, this study highlights significant gaps and opportunities for improvement in architect and designer training.

METHODOLOGY

This study uses a qualitative research methodology to investigate the impact of emerging architectural trends on the education and preparation of future specialists. The methodology comprises a comprehensive review of current literature on architectural innovations, sustainable design practices, and pedagogical methods. The literature review focuses on identifying the critical areas where architectural education needs to evolve to meet current and future challenges. Special attention is paid to studies highlighting the integration of advanced technologies and sustainability principles in architectural practice.

At the beginning of the 20th century, new artists laid new directions and vectors of human development in the educational process. The UNOVIS art group elaborated on the methods of designing non-traditional architectural forms at the architectural and technical faculty. According to I. Chashnik, "the Suprematistic constructions are those drawings according to which the forms of 'utilitarian organisms' are built and composed; hence any Suprematistic project is Suprematism brought out into utilitarianism. The faculty of engineering and architecture becomes a large workshop or laboratory not with mere benches and paints, but with electrical machines, foundries, and all the technologies of magnetic force. Astronomers, engineers, and mechanics embrace a single desire to build organisms of Suprematism as a new economic form of the utilitarian system of modernity". (Sarabyanov, 1992, p. 48)

Lissitzky created Proun works, unique versions of new spatial art. Lissitzky designed architectural models for outer space and emphasized that the essence of Proun lies in the progression through stages of specific creativity rather than in research, inquiries, and the popularization of life. Lissitzky contrasted the inventive functions of architectural art with the representational applied arts, highlighting a visual concept that extends the principles of planar Suprematism into architecture (Balandin, 1968).

According to Kazus (2001), claims that "during the period of avant-garde development, which coincided with the formation of the architectural design system and the industrialization of the country and was perceived as an element of industrialization, architectural activity was transformed from the creativity of individual masters into a complex national system of architectural design, causing the emergence of large architectural design teams and the formation of professional consciousness on the principles of functionalism. Avant-garde architecture (constructivism) was accepted by the Soviet state as the main direction of mass construction. The principle of constructivist functionalism became the basis for the typological specialization of state architectural design organizations and their internal structuring" (p. 56).

Tatlin, and others were among the avant-garde artists involved in the space settlement of humanity. Mendeleyev put forward the idea of creating a stratospheric balloon to reach the upper layers of the atmosphere. We believe that design planning should consider not only the functioning of a person but also the number of necessary rooms or specially allocated areas and their parameters and equipment. Navigation should not only be laconic, but also safe. The principle of energy conservation presupposes the highest degree of economy, i.e., saving money, space, physical strength, etc. Accordingly, the distance from objects and the scale of objects must be ergonomic.

The conditional movement of people must correspond to an engineering and technical solution. On the one hand, it is an escalator or pedestrian zone; on the other hand, it is a flight or hovering in an airless space. It is indisputable that the materials used for construction must be light and durable and withstand high dynamic loads and super-low and high temperatures. They must be easily assembled and disassembled structures. These architectural objects should have a high degree of visibility. Nevertheless, the architect should exclude glass since it is a highly traumatic and heavy material. It should be replaced by high-strength polymers resistant to various temperature conditions. It is logical to use natural factors in the design of objects.

The morphological properties of some forms ensure the structural reliability of the object; for example, the shape of an egg is not only laconic, streamlined by air flows, and meets all the requirements of aerodynamic loads, but is also durable. In the presence of high physical and dynamic indicators, an ovoid or an ellipsoid becomes one of the priority forms in the design. It is also justified to use various curved surfaces that can withstand a high degree of physical and dynamic loads (the Möbius strip).

A large amount of space debris requires the creation of protective systems. This includes protective screens using different polymers, nets, and technological solutions or electromagnetic installations that create magnetic fields capable of repelling chaotically moving objects. A protective umbrella can perform a universal function. Being a protective screen, it can perform the function of radar stations. Radar location at space distances is crucial for the development of the Moon. By studying the morphology of the 3D environment, it can be stated that many parameters of airless space intersect with those of the underwater world. Great ocean depths, high pressure, and low temperatures affect underwater flora and fauna. The forms of deep-sea shells and mollusks, the conditions of functioning of living organisms, and navigation systems in the ocean environment can be a source of ideas for architectural projects possibly used on the Moon. Many sea inhabitants are perfect in form. The millennium-long evolution has embodied all form-generating aspects in functioning, physical and dynamic stability, aesthetics, and much more. The mollusk, having a circular form, has ribs that radially emanate from one point. Consequently, the form is resistant to high physical and dynamic loads, withstands loads exceeding space loads hundreds of times, and has an extremely lightweight mass. Its ribbing is stiffening which, according to the principle of combinatorics, can be transformed.

This circumstance is especially important in space, where the transformation method is widely used. Antennas transform into large-scale planes due to a groove tape probe. The principles of a tape measure, which can be extended over a long distance and maintain its straightness, and corrugation are widely used underwater.

The mollusk shape experiences the least resistance in a wind tunnel. Therefore, its architectonic criteria correspond to the requirements of forms functioning in airless space. Modern science is developing specific concepts for architectural and environmental projects in a lunar city. It studies the Moon's atmosphere, climate, and environment. Many architects and designers dwell on the issues of futuristic space architecture. Logovatovskaya (2022), researchers a space station on the Moon. Logovatovskaya's (2022), article states that *"the most realistic program for the coming years is the exploration of the Moon and the creation of an inhabited lunar base as a launch pad for exploration and flights to other planets of the Solar System".* (p. 55)

Thus, students must master a new spatial model, including such exclusive parameters as environmental saturation, the structure of spatial categories, engineering, and ensuring human life. This requires transformations of the higher education system. Algorithms, methods, and techniques should be changed. In some cases, the best solution is to return to the previous education system. As evidenced by the results of educational tasks, students cannot work with categories of spatial relations. Junior students are not full-fledged architects and do not understand what space is and how to interact with it on another categorical basis.

The adopted course towards the computerization of architectural education deprives students of the need and opportunity to create new spatial systems. This is entrusted to artificial intelligence which offers ready-made solutions, and students choose the path of least resistance because they know that this solution will be correct, although devoid of originality. Architecture cannot exist without originality; otherwise, it is not architecture. Originality should be viewed not as an opportunity to distinguish oneself but as a means of finding new ideas, considering designs, engineering, physical and dynamic properties of space, etc.

CONCLUSIONS

The article emphasizes the critical role of adapting architectural education to meet the demands of a rapidly evolving technological and environmental landscape. Through a comprehensive review of current literature, it becomes evident that there are significant gaps in architectural curricula, particularly in the integration of advanced digital technologies, sustainable design principles, and interdisciplinary collaboration.

One of the main conclusions is the need for educational programs to incorporate modern digital tools, such as building information modeling and virtual reality, which are essential for preparing students for technological advancements in the field. Sustainability must be a core component of the curriculum, addressing ecological challenges through innovative design solutions that are both practical and environmentally responsible.

In the context of space architecture, the absence of gravity and unique environmental conditions present additional challenges that require innovative design solutions. Educational programs must teach students to think creatively and develop new paradigms accommodating these extraordinary conditions.

The study also highlights the importance of interdisciplinary education. Architects must be trained to work collaboratively with professionals from various fields, including engineering, urban planning, and environmental science. This approach ensures the development of holistic solutions that address the multifaceted challenges of modern architectural practice.

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