Toward the consistency of architecture and interior architecture curricula to accomplish sustainability goals

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ABSTRACT: There has been a tendency in the Polish higher education system within the last 10 years to run the faculties of interior architecture, traditionally affiliated to academies of fine arts, at polytechnics, or to offer this field of study by the departments of architecture. Therefore, the students are provided with slightly diverse teaching programmes being executed within different learning environments. Due to the recognition of the detrimental impact of the building industry on the natural environment, it is necessary to employ sustainability-oriented design methods. Hence, it is essential to reflect this perspective in the curriculum of interior architecture, and where it is absent, to ensure a cohesive approach to the design methodology by both disciplines. In this article, the authors discuss the differences in teaching programmes of interior architecture and architecture in educational institutions. They pay special attention to the position of technical subjects in both types of teaching programmes, and consider sustainability as the guideline uniting architecture and interior architecture in education and in professional practice.

INTRODUCTION

Architecture is a discipline that is easily definable and its field of knowledge, as well as its materialisation is comprehensible. It is different in relation to the shaping of building interiors. The term *interior architecture* emerged in the 1970s to describe an autonomous discipline employing *architectural theory, history, and principles in the design and creation of interior space* [1]. Cys admits that interior architecture as the name of the field initially called interior decoration, exists *in some regions*, but still remains globally known as interior design [2]. She indicates that there is a common acceptance of the fact that this specific field of a relatively short history *is still developing as a discipline, a professional practice and a field of research* [2]. Coles and House notice that the growth of this discipline is stimulated in part *due to a perception that by employing the rigour of architectural thinking together with the sensory understanding of interior design, a synthesis could be produced that was both intellectually and humanistically satisfying* [1].

This duality of the field of designing inner spaces is underlined by Klingenberg who claims that:

> *…interior architecture balances in the inter-space between the widely used term design and the term architecture* [3].

Sustainability issues have evolved as the main architectural design determinants and design methodology. They have shaped new guidelines for architecture, respecting the environment by the least possible intervention of new buildings in it. Architecture is considered the only field of art that refers directly to nature since the works of architecture are within nature [4].

The sustainability paradigm has promoted integrated design methods for new buildings. It involves many stakeholders, not only architects and traditionally structural engineers, but also heating, ventilation and air conditioning (HVAC) specialists. A similar situation concerns a more commonly exercised model of adaptive reuse of existing buildings, where design interventions combine retrofitting and interference with the building material substance, thus requiring the active participation of different professions, including interior architects.

The above-mentioned imprecision concerning the appropriate terminology and area of interest of the discipline, as well as the ambiguity regarding the scope of knowledge and skills required to practice interior architecture in a sustainable manner, advise the analysis of the discipline's education framework. This inquiry was undertaken on the basis of the learning outlines currently exercised in Polish higher education institutions, both public and private. Its aim is to verify the differences in the learning environment and curricula of interior architecture with regard to the potential consistency of

both architecture and interior architecture teaching schemes. The latter, in the authors' opinion, remains substantial in the creation of interiors of high environmental performance, and therefore determines the subject of this article.

The term interior architecture, used in this study as most adequate to indicate its distinctiveness, is to emphasise that the creation of interiors is discussed within the built form delineated by the building envelope, which comprises the physical context for inner spaces. Still, the building envelope should not be examined individually as a tight physical boundary for interiors, but as a multifunctional and structurally developed part, which allows to negotiate indirectly with natural surroundings because it is based on the character of their interrelationship with building elements.

The knowledge base of architecture is *traditionally referred to as the science of building* [5], and is considered under three main headings which embrace:

> *…building fabric - materials, construction and structures, building environment - heat, light, sound and energy (passive systems), building services - water, wastes, and energy (HVAC and supply systems, installations)* [5].

These trajectories, along with the non-technical knowledge (e.g. history of architecture, law, sociology, building standards, costing), have traditionally constituted the competence in architecture. The architecture education curricula are constructed to ensure that graduates have the necessary design knowledge and skills [6].

Interior architecture, according to other researchers and academics, should be analysed as a practice that concerns exclusively the remodelling of existing buildings and *often deals with complex structural, environmental, and servicing problems* [7]. Interior architecture can be interpreted then as an activity concentrated on the combination of structural elements, building materials and artistic components, incorporating the art of design and the science of architecture alike. This interpretation of the field of interior architecture and the character of its contribution to the creation of the built environment inevitably makes references to architecture and its specificity as a discipline.

The designing of interiors concerns the *interiority as a space created and conditioned by the exterior - by a building's walls, its shape, or its skin* [8], as well as a space that *itself can condition a building's shape*. In the physical aspect, interiority is considered as the product of boundaries, whereas in the cultural aspect, it implies the influence and presence of the exterior to *create the conditions that render it inside.* The outer conditions comprise these imposed by the natural environment, which impacts the design solutions concerning, among others, structural, physical and technical characteristics of the interior and its components. This sustainable architectural design strategy requires the integrative design process understood as *the practice of designing with sensitivity for sustainability*, where energy, water, material resources and indoor environmental quality decisions *are equally concerned* [9].

Interior architects actively participate in this integrated design process, as they make a contribution to the environmental performance of the inner spaces of buildings. This involvement requires them to acquire the knowledge and competencies chiefly achieved in the process of their professional education. With the increasing recognition of environmental sustainability issues by researchers, academics and practitioners in the field of interior architecture [10], it is evident that there is a need for modifications of the currently offered interior architecture/design education programmes toward the environmental contextualisation of interior spaces. This adjustment cannot be executed by the exact replication of the architectural education process or by generating formal definitions, but by moderating the teaching framework and learning environment of interior architecture to stimulate co-operation between the disciplines, including architects, engineers and other stakeholders involved in the process of creating buildings.

The importance of sustainability issues in architecture and interior architecture should be of similar value. If one wants to analyse buildings in terms of their sustainability characteristics, one should consider them as unities formed out of the building fabric, technical services and interiors along with their equipment. The design of buildings should comprise all these components, and so should the teaching programmes. This research is dedicated to finding out the relations between the curricula of architecture schools, as well as of interior architecture schools in this regard. Which modules or subjects are primarily responsible for the implementation of sustainability characteristics in buildings? What measures should be taken to improve the situation in the case of significant discrepancy in the structure of teaching programmes in both disciplines? This should also respond to the question of the necessity for a balance between them.

METHODS

The assumed methods of the research comprise four stages: 1) definition of technical modules in curricula; 2) collection of data related to the share of technical modules in the teaching programmes of architecture and interior architecture; 3) comparative analyses of both types of curricula; and 4) conclusions and further recommendations. Given the importance of technical subjects for the promotion of sustainability objectives in the built environment, it can be assumed that a close to equal share of technical subjects in teaching programmes both in the case of architectural and interior architecture studies should be achieved and maintained.

For this research, all those Polish schools of architecture and interior architecture were taken into account, which offer both Bachelor's and Master's programmes. The data collected from the schools' published teaching programmes for the academic years 2022/2023 and 2023/2024 were given in European Credit Transfer and Accumulation System (ECTS) points, which were considered a reliable measure of the importance of subjects within curricula, and arranged in a tabulated way defining the percentage of technical subjects in relation to the remaining modules.

There are ministerial legal acts that contain compulsory frameworks for teaching programmes of both types of disciplines [11][12]. For the Bachelor's programmes of architectural studies, 240 ECTS points have been set as a minimum and for the Master's programmes 90 ECTS points. In the case of interior architecture studies, the Bachelor's programmes should indicate a minimum of 180 ECTS points and for the Master's programmes 120 ECTS points. Comparing these numbers, one can see that both Bachelor's and Master's programmes in the analysed disciplines are almost equal in the number of ECTS points with a slight advantage of architecture studies. However, they are differently distributed within both degrees. This means that the overall quantity of the transferred knowledge and practical skills should be almost equal. The standards for architectural studies do not specify the teaching load for technical subjects, unlike the standards for interior architecture studies. In the latter case, the technical subjects indicate 60 ECTS for Building Construction, 30 ECTS for Structures and 30 ECTS for Lighting as a minimum requirement in the first-degree studies, assigning 0 ECTS points for the second-degree studies. The way these numbers are specified testifies to some margin of liberty given to schools in terms of their curricula.

RESULTS OF THE RESEARCH

Before analysing the share of technical subjects in the study programmes, there should be specified a pool of technical subjects taught in both types of schools. Table 1 presents the technical subjects contained in the curricula of both disciplines, enabling their comparison.

Table 1: Technical subjects in ministerial standards for architecture and interior architecture studies.

Technical subjects in study programmes	
Interior architecture	Architecture
Building	Building
-	Advanced Technical Aspects of Design
Building Constructions	Building Constructions
Statics	Statics
Building Mechanics	Building Mechanics
Building Materials	Building Materials
Building Physics	Building Physics
Lighting	-
Building Services (Technical Equipment)	Building Services (Technical Equipment)
-	City Infrastructure

All study programmes should comply with the above-mentioned ministerial requirements. To verify it, the authors analysed the curricula of all 14 schools of interior architecture teaching this discipline in Poland simultaneously at both levels: Bachelor's and Master's degrees. The data contained in Table 2 and Table 3 allowed for comparisons among schools in this regard, as well as for assessment against the minimum required by the standards. Only academic schools have been considered, separately public which dominate this major, and private schools which are in the minority.

Table 2 indicates the range of the final percentage of technical subjects between 1.3 and 6.3 for public schools, and between 4.8 and 8.0 for private schools. The latter is slightly better, which does not come as a surprise, as they are usually considered of vocational character, and therefore closer to professional practice. Such a small share of technical subjects in the whole teaching programme proves a relatively little interest of interior architecture schools in the technical education of prospective interior architects. It is the Master`s programmes that are particularly crippled in this regard.

Table 3 shows a set of relevant data for architecture schools. The data collected for the table demonstrate a much better situation than in the case of the interior architecture education system in this regard. The range of percentage ECTS points for technical subjects is visibly higher, and begins with 5.9% up to 16.7%. In this case, the differences between public and private schools (8.1-12.0%) are much lower than for the interior architecture programmes. In every case, the number of ECTS points complies with the ministerial standards. Comparing the data in both tables, the authors can conclude that the role of technical subjects in interior architecture schools is heavily underestimated, which does not comply with the earlier made statement about a close to equal share of these technical subjects in the curricula of both disciplines.

A remark should be made that the set of technical subjects specified earlier (Table 1) is excessively limited in relation to the remaining subjects within the interior architecture programmes. Given the character of this profession, there is

an overwhelming conviction that the programmes are too incomplete and excessively restricted at a time when the technical input in the design and execution of interiors has been systematically increasing.

Table 2: Academic schools offering interior architecture teaching programmes. Teaching load expressed in ECTS. Public schools 1-12, private schools 13-14 (data collected by the authors).

	University	Bachelor programme			Master programme			Total		
		Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)	Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)	Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)
1	*Magdalena Abakanowicz* University of Arts Poznań	15	180	8.3	4	120	3.3	19	300	6.3
2	Academy of Fine Arts in Gdańsk	11	180	6.1	5	120	4.2	16	300	5.3
3	*Jan Matejko* Academy of Fine Arts in Kraków	17	270	7	0	120	0	17	360	4.7
4	Silesian University of Technology	10	180	5.5	1	60	1.7	11	240	4.6
5	Bydgoszcz University of Science and Technology	5	180	2.7	8	120	6.7	13	300	4.3
6	Poznań University of Technology	9	180	5	7	210	3.3	16	390	4.1
7	*Władysław Strzemiński* Academy of Fine Arts in Lódź	8	183	4.4	4	120	3.3	12	303	4.0
8	*Eugeniusz Geppert* Academy of Fine Arts in Wrocław	11	180	6.1	0	120	0	11	300	3.6
9	Koszalin University of Technology	8	210	3.8	2	120	1.7	10	330	3.0
10	*Mikołaj Kopernik* University in Toruń	9	180	9.0	0	120	0	9	300	3.0
11	Academy of Fine Arts in Warsaw	6	120	5.0	0	120	0	6	240	2.5
12	Academy of Art in Szczecin	4	180	2.2	0	120	0	4	300	1.3
13	University of Ecology and Management in Warsaw	22	210	10.5	2	90	2.2	24	300	8.0
14	Silesian Academy	16	210	7.6	0	120	0	16	330	4.8

Table 3: Academic schools offering architecture teaching programmes. Teaching load expressed in ECTS. Public schools 1-16, private schools 17-19 (data collected by the authors).

	University	Bachelor programme			Master programme			Total		
		Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)	Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)	Technical subjects/modules credits	Total subjects/modules credits	Relation technical/total (%)
1	Kielce University of Technology	33	210	15.7	17	90	18.9	50	300	16.7
2	Cracow University of Technology	33	210	15.7	8	90	8.9	41	300	13.7
3	Warsaw University of Science and Technology	31	210	14.8	10	90	11.1	41	300	13.7
4	Lublin University of Technology	26	210	12.4	13	90	14.4	39	300	13.0

5	Silesian University of Technology	37	210	12.2	1	90	1.1	38	300	12.7
6	Rzeszów University of Technology	29	213	13.6	9	90	10.0	38	303	12.5
7	University of Zielona Góra	29	201	14.4	7	95	7.4	36	296	12.2
8	Bydgoszcz University of Science and Technology	28	210	13.3	7	90	7.8	35	300	11.7
9	Podhale State Vocational University	31	210	14.8	4	90	4.4	35	300	11.7
10	Poznań University of Technology	30	210	14.3	4	90	4.4	34	300	11.3
11	Białystok University of Technology	27	210	12.9	6	90	6.7	33	300	11.0
12	Opole University of Technology	23	210	11.0	8	90	8.9	31	300	10.3
13	West Pomeranian University of Technology	28	210	13.3	2	90	2,2	30	300	10.0
14	Gdańsk University of Technology	22	210	10.5	6	90	6.7	28	300	9.3
15	Lódź University of Technology	23	210	11.0	5	90	5.6	28	300	9.3
16	Warsaw University of Technology	20	228	9.1	0	120	0	20	340	5.9
17	The University College of Enterprise and Administration in Lublin	26	210	12.4	10	90	11.1	36	300	12.0
18	University of Ecology and Management in Warsaw	27	210	12,9	5	90	5.6	32	300	10.7
19	*Andrzej Frycz Modrzewski* Kraków University	20	220	9.1	5	90	5.6	25	310	8.1

DISCUSSION AND CONCLUSIONS

It should be said that both disciplines are officially embedded in two separate fields of science and education systems. Architecture is part of the engineering field, but simultaneously is also considered an area of art. Interior architecture is traditionally placed within art and artistic studies. But despite that formal difference, they are very closely related as buildings are constructed to form interiors. This affinity concerns also the technical sphere.

The importance of this research derives from many discussions about the role of technology in architecture recently. It is widely debated in the context of sustainability. Whereas the input of technologies in buildings escalates, in view of sustainability it should be otherwise.

> *It is apparent that when technology strategically de-escalates, it becomes more appropriate and more applicable throughout a variety of social, economic, and ecological contexts. Lower technology solutions typically are more durable* [13].

This is in line with sustainability requirements, where long-term durability is one of the most important features of this paradigm.

Simple equipment should replace sophisticated equipment. This turn toward the simplification of technologies applied in architectural and interior architecture solutions enforced by the sustainability paradigm is a uniting factor for both disciplines in design and education. However, this trend does not mean a decline in the role of technical subjects in the analysed teaching programmes. Just the opposite, the changing character of recommended technologies makes this issue even more important as new sustainable technologies require more attention by educational institutions to provide prospective architects and interior architects with adequate knowledge. This issue of sustainability poses gradually more problems, and many authors raise the question concerning, for example, the proper response to climate change challenges in architectural studies curricula [14].

One of the basic guidelines of sustainable architecture is the use of *appropriate technology* which means that it is compatible with local cultural and economic conditions, and utilises locally available materials and energy resources [13]. These technologies can be experienced during student practical training in architecture offices. Design studios remain in architectural education as the *main institution of learning* [5]. It provides students with opportunities to address the sustainability questions, concentrate on recognition of their specific aspects, and thus conserve the fragmented and disconnected knowledge on environmental sustainability in interior design [15].

The sustainability-based features related to the technical aspects unite both disciplines in a few ways:

1) Building constructions comprise the shell and interiors with necessary technical equipment (common for both components);

2) Sustainability paradigm *environment-economy-society* applies to both in a similar measure;
3) Technical aspects of buildings are inherent both in the shell and interiors, and they unite the shell and interiors. Considering these facts, the sustainability paradigm in the scope indicated above should also be applied to the architecture and interior architecture educational framework;
4) Integrated design involves the participation of many specialists, including interior architects who have to collaborate with architects in common works;
5) Like in constructed buildings, this collaboration should also be implemented in both educational systems.

The sustainability-related factors in building construction in the area of technical aspects significantly enhance the consistency of architecture and interior architecture in design practice and have also an impact on the educational system.

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