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Education of architects: Walter Gropius' ideas a century later

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ABSTRACT: The education of architects in Poland follows a specific sequence: standards defined by the Ministry of Science and Higher Education concordant with European Union standards; educational outcomes defined by a specific school; module charts formulated by academic teachers. As a result of this sequence a freshly graduating architect becomes equipped with appropriate knowledge, skills and social competencies adapted to contemporary times. At the start of the 20th Century, Walter Gropius formulated a highly specific vision of the role of the architect in society and a model of education associated with this role. He published this in a book, *Scope of Total Architecture*. The author of this article has confronted the recommendations by Gropius with the reality of educating architects at the Faculty of Architecture at Cracow University of Technology (FA-CUT), Kraków, Poland, and the author's own observations. Highlighted here is a series of timeless requirements in architects' education, in addition to observing differences associated with time and changing conditions.

Keywords: Architectural education, qualities and attributes, Walter Gropius' educational ideas

INTRODUCTION

The curriculum for the education of architects in the European Union is regulated to standards that ensure university graduation diplomas are recognised throughout the EU member states. Architecture schools are required to define educational outcomes in accordance with these standards and to develop curricula and syllabuses for individual modules or programmatic blocks. As a result, a freshly graduated architect is equipped with appropriate knowledge, skills and social competencies, tailored to the needs of contemporary times. As the author has shown in the article, *Interdisciplinary education of architects both globally and locally*, the goals of the education of architects and the skills of an architect were already defined by Vitruvius, who considered it necessary for there to be a broad and multi-disciplinary education of architects, and for the process of teaching and studying architecture to predominantly feature a combination of theoretical knowledge and practice [1].

Over the centuries, the ideal of an architect as builder has remained largely unchanged. Significant changes occurred as a result of the industrial revolution, mass production and the demand for mass construction, magnified by the destruction wrought by the First World War.

Walter Gropius, considered one of the most outstanding architects of the 20th Century, was born towards the end of the 19th Century in Berlin in 1883. In the preface to his book, *Scope of Total Architecture*, he wrote:

> *Creation and love of beauty are elemental for the experience of happiness. A time which does not recognize this basic truth does not become articulate in the visual sense; …the usual practice of architects to relieve the dominant disjoined pattern here and there by a beautiful building is most inadequate and that we must find, instead, a new set of values, based on such constituent factors as would generate an integrated expression of the thought and feeling of our time* [2].

Walter Gropius had a clear vision of the architect's role in society and the associated model of education. He believed the political, social and civilisational changes that took place at the turn of the 19th and 20th Centuries were so significant that education in its then-current form could not meet the requirements of the future. In 1919, he founded a modern school of architecture in Weimar: the Bauhaus. The curriculum of this School was a novelty at the time. The need to define architecture, its role and the significance of the architectural profession anew was based on a number of premises. They included the necessity to rebuild Europe after the destruction of the First World War, the increasingly intensive industrialisation of building construction and a new outlook on human needs [3].

A century after the founding of the Bauhaus, there are differences in the development of civilisation, yet many problems and challenges remain the same. These include the rapid development of construction technologies and methods, new design techniques, as well as progressively increasing spatial chaos and the still unsatisfied housing demand. The author made an attempt at incorporating a selection of Walter Gropius' views into the curriculum taught in the Faculty of Architecture at Cracow University of Technology (FA-CUT), Kraków, Poland, as well as the author's convictions, based on many years of experience as an academic teacher and Vice-Dean of the FA in charge of education.

WALTER GROPIUS AND THE FA-CUT

In the preface to his book mentioned in the introduction, Walter Gropius expressed his views on the education of architects, detailing his thoughts on numerous aspects [4]. Of these, the author selected those that are the most essential, and discussed them in the following thematic groups:

a) general education and understanding architecture;
b) architectural and urban education from kindergarten onwards;
c) predispositions, creative design and teaching methods;
d) onsite practice, language of communication;
e) staff quality and education conditions.

The analyses that were performed indicated a significant amount of timeless perception by the excellent architect and teacher that Walter Gropius had been, including his main position concerning maintaining a balance between experience and theoretical knowledge. Following are the analyses of the discussions of the thematic groups.

General Education and Understanding Architecture

Walter Gropius highlighted the significance of creative design. He wrote:

> *I therefore believe that the architecture of the future is destined to dominate a far more comprehensive sphere than it does today. …Today our architectural education is far too timid, overemphasizing scholarly discipline and almost solely directed toward the so-called Fine Arts and toward the past.*

Confronting this view with the situation of architecture in the 20th Century in Poland, it was found that architectural education is broad, and sufficiently covers the various aspects of design and construction. However, it is essential for society at large to understand architecture and its significance. The National Centre for Culture (Poland) carried out a study which concluded that the fundamental problem here is that respondents are not able to define what architecture is [5]. They were reported to barely acknowledge the significance of architecture beyond its utilitarian usefulness and typically (as many as 65 percent of respondents) associated it with the construction industry. Therefore, they did not see the element of art necessary in the creation of architecture and the surrounding space. It demonstrates a lack of understanding of the quality of architecture and space in broadly accessible media and, as a result, the lack of a source of broadly accessible information on the subject.

A definition of architecture given to students at the FA-CUT states, it is the *art* of shaping space according to the needs of humans in concordance with nature. This definition encompasses the entirety of the complicated matter that is to be relayed to people in an accessible way and in an appropriately prepared education process. That a greater degree of awareness was reported by persons with higher education suggests education can expand knowledge on the subject of properly shaping space and architecture, the significance of architectural beauty and heritage, as well as the role of architecture and space in the contemporary world, and the promoted policy of sustainable development.

This need is reinforced by the information that the majority of respondents reported they did not pay attention to how buildings, devices and the space that surrounds them look. The question: are you interested in, do you pay attention to, how buildings, roads, streets and squares look, and how various places are developed and arranged in the locality that you live in or frequent?, saw just six percent of respondents answer that they showed a high level of interest, with 43 percent answering that they were somewhat interested.

A similar conclusion can be drawn from conversations with students, who openly admit they do not pay much attention to the space that surrounds them in their everyday lives because they constantly use electronic devices: phones, smartphones, GPS and other. This predisposed the author to take an appropriate look at the tools that at present should be implemented in broadly understood architectural education.

Architectural and Urban Education from Kindergarten Onwards

Walter Gropius expressed the view that *Training must be started therefore in nurseries and kindergartens, giving the children abundant opportunity to build, model, draw, and paint in a very free form, as in play, which is intended to attract the child and to stimulate his imagination*.

The author fully agrees with this statement. Freedom and stimulating the imagination should be the goals of children's playing activities from their earliest years. As school years go by, it is necessary to expand knowledge that is gained

on the go when playing, to include the principles of the construction, design and shaping of space. Understanding the essential role of architectural and urban planning-related education in the development of the creativity of young people is common among architects in Poland and abroad. It is a field in which organisations and individual architects, and educators are highly active.

The author's experiences during teaching architecture in Kraków as a part of workshops for children, an original programme called *Architecture and the Environment* for a high school and as a part of the international movement, *Architects in Schools*, directed by the Royal Institute of British Architects (RIBA) and the Experiences Trust organisation, under the patronage of Sir Richard Rogers, justify the statement that broad architectural and urban planning-related education is a necessity [6]. The role of the educator also should be played by architecture schools and this is what is happening as a part of the projects comprising the Third Mission of the CUT. The Chair of Housing Environment of the FA-CUT, as a part of the *Young Architects* grant programme, has implemented a curriculum for primary schools that can be treated as a pilot programme for grades one through eight. Similar activities and forms of action have been propagated in various professional and educational circles for many years.

The Polish National Institute of Architecture and Urban Planning (NIAUP), founded in 2018, includes the development of architectural and urban planning-related education in a mission statement and steps were taken to place this education in school curricula. It is important to note that the thought expressed 100 years ago by Walter Gropius is still topical. The author is among a group of experts formulating the principles shaping this programme, while also providing for adults of various ages. A survey carried out by the NIAUP among the participants of the First Architectural Education Congress demonstrated that the educational movement is most active and the forms in which it is developed are highly varied.

From the titles of educational courses mentioned by respondents it can be concluded that they focus on three basic thematic groups: architecture, urban planning/space and historical heritage. As practice suggests, the systemic education programme should be based on similar forms and subjects, while problem areas should cover both structure and materials, e.g. truss-based structures, building from local materials, function and scale (i.e. scale-proportions-dimensions, my room-my classroom-my workplace), urban planning (i.e. the walls of a public space, *our* common yard), history and heritage (i.e. the city in the past and the present, customs-legends-historical sites).

Predispositions, Creative Design and Teaching Methods

Walter Gropius wrote: *In order to diminish the number of false decisions made in this respect a sort of qualification test should be passed by all - a test of creativeness and power of imagination*.

Architectural and urban planning-related education of the youngest generation is aimed at improving the overall level of spatial awareness in society. It is obvious that some young people who are interested in the classes and the subject will want to develop their skills by studying an architecture course at a university. In architectural schools, there are various forms for verifying a person's predispositions. The architecture course features additional tests. Their result determined according to an algorithm using grades from selected subjects obtained at the maturity examination and the final number of points decides whether a person is admitted to university or not.

The forms of testing are varied: a freehand drawing examination with a still life and an imaginary subject; spatial tasks to be presented of models; tests verifying knowledge of architecture; interviews that make it possible to get to know candidates and their motivations. There is no agreement among educators as to the form most suitable with which to assess predispositions. However, there is agreement with Walter Gropius that drawing or painting is not enough to develop a sense of space, and therefore they might not prove sufficient as a means of assessing predispositions. A competent and objective manner of assessing them still is to be devised.

Walter Gropius did not consider that perfecting professional skills be the fundamental goal during the first stage of study, instead he stressed development of character. At the FA-CUT this goal is achieved through a module called Introduction to Architectural and Urban Design. The variety of short design projects, featuring both abstract subjects and subjects grounded in reality, makes it possible to release creativity. Some of the projects are shown in Figure 1.

Figure 1: Projects prepared by first-year students at the FA-CUT, representing thematic variety (left to right): an arrangement of space employing simple solids; a conceptual proposal of a complex of buildings; and a building following the principles of sustainable design (Photographs by the Author).

A particular role at this stage is also played by the instructor's personality, which was also pointed out by Walter Gropius. A teacher must discover each student's hidden talents, support their individual development, inspire them and lead them along their own path.

The division of architectural studies into two tiers (tier one: Engineer's studies; and tier two: Master's studies) in most European countries forced a change to the curriculum, and the defining of educational outcomes separately for tier one and tier two studies [7]. Ultimately, however, practising the architectural profession is possible only after completing both tiers, defending a Master's project and fulfilling all of the necessary requirements to obtain a licence.

The goal of studies, according to Gropius, is primarily to master the method which - due to rapidly changing possibilities and conditions - is seen as more important than specialist knowledge. He pointed to the significance of experimentation and creativity, which help to meet new challenges. In the mission statement of the FA-CUT, the Faculty is oriented to the developing of knowledge disciplines and the culture of the scientific experiment, in addition to developing creativity and innovation, in an integration of the present with the future. Two examples of this approach are shown in Figure 2.

Figure 2: Fragments of Master's projects. (Authors: K. Rafacz, M. Lichoń) for Zakopane and Nowy Sącz. In both cases the authors approached their subjects creatively, basing innovative functional and spatial design proposals on in-depth analyses of local conditions, including local traditions and needs resulting from the strategy of sustainable development (Photographs by the Author).

It appears that, particularly in the 21st Century, when changes to technologies and materials, as well as the needs of people and the environment are occurring at an increasingly faster pace, the thought expressed by Gropius on the subject of the primacy of the method is particularly worthy of consideration. The author fully agrees with his view that the manner of approach to a design of a chair or city district should be, in principle, identical. It is only the amount of information and level of detail that needs to be taken into consideration, when performing analyses, constructing programmes and making decisions.

It is obvious that a student during their university years is not capable of coming into contact with all types of design, whether of buildings, complexes or urban areas. However, the student can be taught a method with which they will creatively approach any subject. At the FA-CUT, this is aided by the variety of subjects that students can select for projects, the possibility of selecting an instructor and project subject, project exhibitions, confrontations and defences, as well as broad co-operation with business and local government.

There is no agreement between schools and teachers as to which, and what type of, projects should be performed by students over the course of their studies. What is agreed upon is that they should, as a student advances to later years of study, focus on increasingly complicated problems and structures, while taking into consideration the unity of form, function, structure and economy.

Therefore, integrating a broad range of problems becomes the fundamental task, for as Gropius wrote …*educational experience has shown that it takes years to bring the student into the habit of simultaneously conceiving all three - design, construction and economy - as an inseparable and interdependent entity.* The FA-CUT, when teaching modules, strives to integrate the problems that students encounter during design projects. Actions that have been taken since 2017 integrate the design process, while transferring knowledge on building construction, structural engineering, materials, as well as installations and, at the same time, introducing computer-aided design [8].

Onsite Practice, Language of Communication

In his book, Walter Gropius stated that professional practice on a construction site should be an inseparable element of teaching, adding it should take place at the very beginning of education, instead of when the academic stage had already come to a close. The architect thought it necessary for students to undergo practical training at a construction site, featuring familiarisation with materials and construction techniques. In the 21st Century this idea remains relevant. The practical training students undergo during studies takes on varying forms. Architectural education standards require

at least four weeks of training over the course of the first tier of studies. There is no statement about the scope of practical training during the second tier.

At the FA-CUT, as a part of tier one studies, students undergo 30 hours of practical training in freehand drawing during the first year; 120 hours of practical training in building construction during the second year and 60 hours of surveying training during the third year. This amounts to a total of 210 hours, which is more than five weeks [9]. Over the course of tier two studies, the student is obligated to take part in 30 hours of urban planning practical training and 120 hours of practical training in design or three weeks.

Freehand drawing, surveying and urban planning practical training is organised by the University. The place where a student undergoes practical training in building construction is selected by each student. The Council of Employers that co-operates with the Faculty, and has been established by the Dean, includes representatives of design companies, as well as the head of the Lesser Poland Chamber of Architects and representatives of the Association of Polish Architects, and is of immense help. The Council co-ordinates co-operation with design companies, which propose places for students to undergo practical training through the Chamber of Architects. As Gropius wrote …*a language of vision derived from old and new discoveries in science controls his creative act. It provides simultaneously the common key for understanding the artist's message and transforms its paradoxical content into visible terms of expression*.

In the 20th and 21st Centuries, the language of communicating and presenting designs underwent - and is undergoing - a rapid evolution. The capabilities of computer software have dominated traditional forms of communication: the drawing and the physical model. However, after a period of fascination with the possibilities offered by new tools, the freehand sketch is once again appreciated, which makes it possible to present the idea behind a design in the quickest and most suitable way. However, computer programs that make it easier to design; integrate the various branches of engineering; verify a design and make changes to it are taking their rightful place.

The role of the physical model, which *does not lie*, and provides extraordinary possibilities for creating spatial conceptual proposals, is still appreciated. At the FA-CUT, the curriculum features freehand drawing, sculpture and modelling, as well as computer-aided design, including business information modeling (BIM) software. It is only the possibility of combining these various techniques in the process of design that gives freedom to express ideas, conceptual proposals and technical drawings.

The significance of the language of communication between designer and future user should be noted. Simplicity and clarity of communication are conducive to conversation and discussion which, in the period of public participation, take centre stage. Students of the FA-CUT take part in discussions with municipal officials and representatives of local communities, which helps in the development of appropriate forms of communication. Knowledge and the skill of reading a design, understanding spatial and functional relationships, facilitate discussion between the designer, developer, user and decision-maker.

Staff Quality and Education Conditions

The quality of teaching staff and the conditions of education play a key role in the education of architects. These elements, similar to those previously discussed, are the subject of analyses of accreditation commissions. Attention is focused on maintaining a balance between theory and practice, as well as on access to knowledge and the manner of its transfer during classes. Both the Council of Employers and accreditation commissions focus on design and project completion experience among academic teachers. The quality of teaching staff is proven by the number of academic teachers who are licensed as independent architects, as well as the amount and character of design projects developed and built as listed on their résumés. This element was also noted by Walter Gropius, who highlighted that …*Teachers should be appointed only after sufficient practical experience of their own, both in design and building*.

Practical experience is one of the qualities of an academic teacher who educates architects. The second is knowing the forms of transferring knowledge, pedagogic talent and involvement in the process of transferring knowledge and skills. Young candidates for academic teaching go through mandatory pedagogic training before beginning work with students. They learn pedagogy and psychology, as well as teaching techniques. However, these cannot replace predispositions and personal involvement. Walter Gropius particularly stressed the role of an atmosphere of involvement that makes it possible to implant into young people a sense of mission and understanding of the significance of the architect's work and their responsibility for the shape of space and quality of life.

The third element necessary to becoming a good academic teacher is knowledge and expanding it in terms of the latest achievements of architecture and urban planning, as well as their associated fields, such as psychology, sociology, health-related and environmental sciences. Walter Gropius pointed to these strong relationships numerous times in his treatise. This subject was of particular importance at the beginning of the 20th Century, because of the growing demands concerning quality of life or ongoing changes in lifestyle resulting from economic and systemic changes.

In the 21st Century, these aspects have not lost their importance, while the significance of knowledge about the broadly understood environment, as well as of the precepts of sustainable development and sustainable design has increased. The skill of analysing, synthesising and transferring knowledge has gained in significance. Scientific work both by teachers and students, particularly those of tier two studies, has also gained in significance.

Walter Gropius presented a view close to the academic teachers of the FA-CUT that design is a science. He wrote: *…An individual of the species man has certain characteristics in common with others of his kind in the way he perceives and experiences his physical world …If we can understand the nature of what we see and the way we perceive it, then we will know more about potential influence of man-made design on human feeling and thinking*.

At the FA-CUT, the skills of defining research problems and conducting research work are taught by performing broad analyses that precede the formulation of design proposals; these analyses are through the study of literature and investigating cases as to the state of the art and experiences in this field on the scale of global science and design practice, in addition to the writing of an essay as a mandatory part of an Engineer's and Master's project. The methods of scientific work conducted in the field of architecture and urban planning are varied, just as the matter featured in this discipline is varied.

When discussing conditions necessary to educate architects, Walter Gropius highlighted the significance of the size of a school and the number of students in a design class. He believed it is easier to achieve the desired educational outcomes at a smaller school, although he did not define its size. According to Gropius, a small scale provides an opportunity to foster an atmosphere of community and co-operation, of scientific and creative ferment. Although, at a large school, with greater instructor involvement and with good logistics, there can be similar conditions around design projects or by using interesting and active teaching methods.

Walter Gropius' highlighting of the significance of the number of persons in a design class with a single teacher is justified. He defined this optimal size at between 12 and 16 people. These are the requirements at the FA-CUT, where the number of students in a design class group should not exceed 15. Surely, it is necessary to strive to bring this number down to 12 students per instructor. This would improve the accessibility of teachers, make their work easier and be conducive to achieving better educational outcomes.

CONCLUSIONS

As a conclusion, it would be appropriate to quote a statement by Walter Gropius: *…The architect is to be a co-ordinator - a man of vision and professional competence - whose business it is to unify the many social, technical, economic and artistic problems which arise in connection with building. The architect has to recognize the impact of industrialisation and should explore the new relationships dictated by social and scientific progress*.

The curriculum taught at the FA-CUT is aimed at instilling this attitude and providing appropriate knowledge and skills. The accreditations given to the Faculty in 2017 and 2018 by RIBA and the Accreditation Commission of the Universities of Technology (ACUT) demonstrate the achievement of these goals. Both of these assessments have had taken into account a school's mission statement; curriculum and educational outcomes; the scope of practical training and links with the economic and social environment, in addition to the quality of teaching staff and educational outcomes.

It should be highlighted that although a century has passed since the establishment of the Bauhaus school, the main requirements placed before a graduate of an architecture course and the curriculum that is taught to future architects remain unchanged. A broad curriculum covering technical, artistic, social and economic problems is still desirable.

The integration of these, making it possible to understand the relationships between them and that they are necessary in the design of buildings and spaces friendly to humans and the environment is still essential. A key role is ascribed to professional practice and relations with the building process. The essence of teaching expressed by Gropius: the primacy of teaching how to think and teaching a method over an excess of details that change as civilisation develops, remains the same.

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