

Guest Editorial

The year 2020 will go down in history as one of great changes in the mode of communication, surprising us all - both in the relations between members of local communities and on the global scale. The Covid-19 pandemic caused the necessity of isolation, keeping social distance and imposing rigorous sanitary regulations.

The techniques and methods of education in academic institutions have also changed, including technical universities. We are discovering, on a weekly basis, how much has really changed. We have no influence on it at all, and have to adjust ourselves to the recommendations of governments and medical experts. Therefore, it seems to be interesting to present and compare new ways and methods of on-line education. These issues are tackled in several articles in the current issue of the journal. All the teachers, not only academic ones, nearly everywhere in the world, were confronted - all of a sudden - with such a task. Academic institutions in the technologically advanced countries, where students privately own hardware and indispensable software, are in a better situation. Still, there are universities in the world where only a few students in a given cohort have access to a desktop computer or a laptop. Then, connection and communication between lecturers and students take place by means of mobile phones or landlines, not necessarily privately owned or easily accessible. G.M. Masilo, S. Simelane-Mnisi, A. Mji and I. Mokgobu from Tshwane University of Technology in Pretoria, South Africa, point that out in their contribution.

Internet access is yet another problem. Most likely, in many countries or in smaller communities, where the optic fibre network is not easily accessible, one may observe the problem of network overloading. In countries where all-level schools have been closed and education changed to on-line, quite often several and more persons have to use the Internet simultaneously.

Many students have left for their homes, often several hundred kilometres away from their institutions, and have given up their flats rented in large university cities. Quite often they are alone in their studies, using mainly the Internet as the source of information. N. Alim, H. Mahmud and F. Gunawan from the State Islamic Institute of Kendari in Indonesia, and M.S. Md Saad from the Technical University of Malaysia Malacca in Durian Tunggal, emphasise the educational usefulness and acceptance of the Google Classroom platform by students in their learning.

W. Meng and R-C. Zhang from Dhurakij Pundit University in Bangkok, Thailand, present the underlying mechanism of the effectiveness of college art design courses in mobile learning. Their research shows that students with creative mind traits achieve better results in art design courses through mobile learning based on the concept of media richness theory.

The next article, by A.O. Amoo, A.J. Swart and J.K. Adam, from the Republic of South Africa (RSA), shows the involvement of women - lecturers in engineering courses - in the process of academic education. The research conducted at 43 Technical and Vocational Education and Training (TVET) college campuses in Gauteng in the RSA determines that female academic teachers seem to be more involved in the institution and in reaching good results in the teaching process than men.

C. Lewis, K. Wolff and B. Bekker from Stellenbosch University also from the RSA show the benefits of project-based education through a community of practice for postgraduate students in renewable energy, in view of cognitive, mental and systemic (CAS) dimensions, which are relationally considered.

The majority of the articles in this issue have been written by architects. Architecture is a discipline which connects technical sciences with the humanities, and also with artistic disciplines, including the visual arts. In many countries, academic teachers, preparing their lectures, exercises and design assignments had to acknowledge that libraries and museums have been closed for a second time over a year. Usually, many courses in architectural history are taught in historic buildings and sites, whereas classes in art history are held in museums. In Poland and other European countries, study and field trips are part of architectural curricula for both the local and foreign students. This approach enables studying many historic cities, and their historic and contemporary architecture *in situ*.

For example, students at the Faculty of Architecture in Cracow University of Technology (FA-CUT), Kraków, Poland, would normally visit historic monuments not only in the country, but also in other places, like Italy or Germany. Now, for the second year in a row, they can undertake only virtual tours. Thus, a change in educational methods, as well as class location turned out to be necessary. B. Makowska points that out in her article. The author opines that on-line education in freehand drawing may result in less positive outcomes for students in fine arts. The majority of students that begin their architectural education has at least an average command of freehand drawing. Teaching drawing and design courses at the FA-CUT are based, above all, on corrections of students' freehand sketches during discussions on the progress of their works. A freehand sketch is the language of architects.

In the case of on-line teaching, detailed information written by teachers and responses from students are necessary. Such a mode of teaching becomes much more time-consuming than meetings and discussions in groups at university halls. It also forces academic teachers to change the drawing tasks. At present, the classes may take place outdoors, when the weather is conducive and keeping the required distance is possible; alternatively, they can be based on drawings from imagination or inspired by photographs. Everybody is trying to enhance and ameliorate the on-line teaching. To that end, students are asked to complete numerous questionnaires, which are a basic research method referred to in nearly every article. For example, J. Kobylarczyk and D. Kuśnierz-Krupa collected questionnaires evaluating on-line teaching among students from two technical and artistic institutions, one from Kraków, Poland (CUT) and one from Kiev, Ukraine (National Aviation University).

T.I. Mtshali from the University of Limpopo in the RSA addresses the issue of engagement between academic teachers and students, to provide better education, and gain knowledge during their courses in graphic engineering and analytical drawing. Broad and long conversations are particularly helpful in teaching both abstract and practical courses. In turn, D. Juniati and I K. Budayasa from the University of Surabaya in Indonesia discussed the problem of teaching mathematics and geometry in higher education institutions. The introduction of a field project is truly interesting, as it is linked with extant problems in the conditions of students' local environment. The problem in teaching mathematics is illustrated by examples of students constructing complicated shapes and volumes. Well-designed classes and concrete tasks in the field enabled students to take real interest in mathematics, to better understand mathematical terms and their properties. This approach has also considerably minimised the stress and anxiety during studying mathematics.

A. Taraszkiewicz and K. Taraszkiewicz present the knowledge of students regarding the living environment, which provides the sense of security and freedom. Their article is based on the results of questionnaires among Polish, French, Belgian and Tunisian students. The fulfilment of the need to calm, order and harmony in one's own life is a basic human right. Architecture students should understand the psychological needs of various groups of people. In the opinion of the authors, it is essential to open up for various emotions and feelings, and to treating the inhabited space as one's own. Only then the inhabitant feels content and safe in that space. For a few years now, selected sociology and psychology topics have been introduced into architectural curricula.

The authors of the next article, J. Borucka, P. Czyż, W. Mazurkiewicz and Ł. Pancewicz from Gdańsk University of Technology and I. Perzyna from the City Initiative Association, discuss the involvement of architecture students in the revitalisation projects of market squares in throughout Poland. Methods used in the participatory process and their influence of enhancing students' social competencies are considered here. The students take part in workshops and projects of the Gospostrateg programme, lasting for three and a half years (2019-2022), and financed by the National Centre of Research and Development in Poland. The aim of the participatory workshops is to find the best design solutions for market squares, as well as to educate and raise awareness of the market community, which should be advantageous for their business.

B. Widera from Wrocław University of Science and Technology (WUST) draws attention to the education of architecture students in the light of the Green Deal Programme launched by the European Commission in 2020. Within this programme, architects have to ensure that new buildings are climate resilient and their construction is informed by specific requirements on energy efficiency in buildings. This topic is particularly relevant to Poland, where the fossil fuel energy consumption is one of the highest in the EU countries.

The aim of the article by E. Grodzka also from the WUST is to present the method of design thinking, which integrates many disciplines. This method, originating from academic circles, was applied in the USA also in business, and in the Faculty of Architecture at the WUST it was introduced in the History, Conservation and Restoration of Greenery course in the first year of the second-degree studies. The method pertains to the issues of culture, philosophy and creative solutions of problems linked to the search of a valuable path towards innovation in life and the fulfilment of the needs of contemporary man.

A. Jasiołek, P. Nowak and M. Brzezicki from the same university present an analysis of advantages and disadvantages of on-line and face-to-face teaching in architecture. Their research and evaluation of teaching were conducted on a group of 52 students of the final year of studies. The authors have experienced both forms of teaching, direct and on-line - the latter as required by the Health Ministry and the Ministry of Science in Poland since mid-March 2020 until now. Based on the SWOT analysis of students' answers, the authors propose a new, hybrid method of teaching architectural design.

Sustainable architecture means developments that are human- and environmentally-friendly in respect of economy and society. J. Jabłońska from the WUST and S. Ceylan from Bahçeşehir University in Istanbul, Turkey, refer to applying sustainable architecture in two countries - Poland and Turkey - and discuss the ensuing differences. Various insulation and climate conditions in both countries result in differences and similarities in teaching, design and ideas, as well as in the concept of sustainable architecture. The differences between the design projects of final-year students are grounded in the general programmes - curricula - accepted at both universities. Such experiments between universities are very conducive to successful teaching and they are a recommended method.

The next group of academics J.F. Łątka and J. Michałek, from the same university in Wrocław, present the co-operation between architecture students and civil engineering students. This co-operation and its outcomes were tested during the experimental course ProtoLAB, delivered in the Faculty of Architecture and in the Faculty of Civil Engineering. This is an important experiment because in the future, the two disciplines will be combined in the professional work.

The next article focuses on the interdisciplinary education of students in design and business curricula whose common task was to solve problems regarding future trends of life in a large city. This time both universities involved were situated in one city, i.e. in Bratislava, Slovakia. The authors are Z. Turlíková and P. Paliatka from Slovak University of Technology in Bratislava, and V. Orfánusová from the University of Economy. The article presents their methodology of co-operation between the two institutions. The focus is on the mutually complementary scope of topics taught at each institution, which could enrich the knowledge and competencies of students. The results were interesting and brought considerable advantages both for the students of architecture from the Institute of Design at the Faculty of Architecture and Design, as well as for the students of business at the Faculty of Commerce.

A. Sygulska from Poznań University of Technology opines that architecture students should be prepared to solve acoustic problems in buildings. Moreover, not only in buildings designed for musical performance, like concert and philharmonic halls, but also in theatres and conference halls. Finally, during works on large, prestigious buildings for culture, world-renowned acousticians are employed, like for instance Yasuhisa Toyota from Japan. However, an architect should be aware of the way in which an architectural form - a shape - and the used materials influence the good acoustics of an interior.

Many academic teachers realise that students' design projects and also diploma designs regarding architecture and urban planning were not, and often are not, linked to real-life assignments. Therefore, the authorities of architectural departments are signing agreements with mayors of local municipalities in order to get design tasks based on actual assignments. In such cases, students and future graduates feel more disciplined and seriously involved in their work. A. Matusik presents a diploma design project in urban planning at the FA-CUT, regarding the development of a fragment of the city centre of Łódź, which was elaborated on the basis of co-operation with the City Urban Planning Studio. In this diploma work, parametric techniques were applied, to keep all the data necessary for urban planning and their constant modelling aligned with the current city policies.

The consecutive four articles come from the FA-CUT: A. Staniewska, who teaches courses in landscape architecture, outlines the course in universal design and its role in the contemporary education of prospective engineers. The results of her research show the necessity of enriching the curriculum with theoretical and practical modules, taking account of persons with special needs in different age groups and with various kinds of disability. The author also points out the need of students' contact with the disabled, so that they better understand the special needs and requirements necessary for adjustment to life in society. P. Mika also stresses the importance of teaching universal design to prospective architects, i.e. designing buildings adjusted to the needs of persons with special needs, including the disabled. The views of the author are based on his own experiences in teaching structural solutions of all the building's components and the surrounding public spaces.

In her article, K. Racoń-Leja discusses changes in the methodology of teaching the Urban Transport course at the Bachelor of Architecture curriculum, which was introduced in the current academic year at the FA-CUT. In the previous years, the course was taught separately and was offered for Bachelor and Master of Architecture students. Currently, it is integrated with urban design, thus adding up to one module. Moreover, the introductory lectures were conducted in the preceding semester. The matter is particularly important in the dense urban areas where, for instance, slowing the traffic and reducing its impact enhances the possibility of achieving attractive public and green spaces in the designed city areas.

Every student of architecture dreams of realising their Bachelor (engineer) or Master diploma design as an actual project. Such a possibility was created for 15 diploma students in the academic year 2018/2019 at the FA-CUT. Then, the owner (private investor) of a historic hotel in Tyssedal in Norway, along with the diploma designs supervisors and with the consent of the Dean of the FA-CUT, organised a competition for adaptation and extension of the hotel, built in the beginning of the 20th Century. The competition - *The Wire* - is discussed in the article by J. Białkiewicz who presents two awarded entries. They are very different in terms of design solutions - one was an engineer's (Bachelor) diploma, and the other was a Master diploma design.

Summing up, I wish to accentuate the current problems tackled in the articles published both in the World Transactions on Engineering and Technology Education (WTE&TE), as well as in the Global Journal of Engineering Education (GJEE), and to recommend the included writings on current trends and experiences regarding methods and good practices in the education of engineering and technology students to a wide academic audience.

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