

Academic knowledge versus professional practice in graduate architecture studies

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ABSTRACT: The aim of the article is to present an innovative model of co-operation between Cracow University of Technology (CUT), Kraków, Poland, and a private investor, in order to organise a new form of graduate work for final-year students. Two groups of students for both engineering and Master's studies, were invited to develop a project for a private hotel's modernisation as their graduate work. The students had the chance to see the existing building *in situ* and to co-operate with a real investor on specific requirements. The work was organised in the form of a competition, with the winning project chosen by the investor. According to a survey administered to the students, the practical and challenging aspects of the work were highly rated; however, the co-operation with a real investor significantly increased the difficulty and development time of their graduate work. The investor appreciated the students' fresh view, the originality of their concepts, and also their openness to suggestions. This new model of graduate work provides students with practical experience consistent with the architectural practice.

INTRODUCTION

The aim of effective architectural education at the tertiary level should be not only to provide students with proper theoretical knowledge, but also to prepare them for practising within the existing labour market. In the current conditions of architectural education in Poland, newly graduated architects need to gain experience starting basically from the zero level, with no practical knowledge about market competition, architectural contests or co-operation with investors. Therefore, most often they start from supporting roles in architectural studios, having very little chance to develop and present their ideas at the most important stages of the projects.

In the academic year 2018-2019, an experimental project was implemented in the Faculty of Architecture at Cracow University of Technology (FA-CUT), Kraków, Poland [1]. The objective of the project was to propose to final-year students a new form of graduate work - an architectural contest involving a private investor. Instead of preparing a standard diploma work, which is most often invented entirely by the student and not related to any real architectural venture, students were invited to co-operate with a private investor and develop a project, which meets specific requirements and international standards. The project took place as a competition in two stages - for engineering and Master's studies - and the winning solutions were also chosen by the investor, not by the standard academic examination board.

After the project's completion, an evaluation has been carried out to examine the following issues:

1. Relevance - was the project adjusted to the expectations and educational capabilities of the participants?
2. Effectiveness - has the goal been achieved?
3. Usability - are the participants able to apply the acquired knowledge and skills in practice?
4. Originality - what distinguishes the project from other initiatives undertaken by the FA-CUT?

The final question summarising the evaluation related to the value of continuing with the idea and form of this experimental project into the future. As an evaluation method, a survey was taken among the students who took part in the project, one year after its completion. They were asked not only to give their general positive or negative feedback from the time perspective, but also to indicate some specific values, such as the difficulty and the amount of time spent as a consequence of the close co-operation with the investor.

THE PROJECT

The project was initiated by the investor, who chose an academic centre in Kraków and presented his idea at the FA-CUT. The idea of confronting academic knowledge with practice has always been vital to the University authorities. Students at the Faculty of Architecture are often provided with opportunities to carry out projects in co-operation with local

communities, government authorities or private companies [2]. In this case, the new aspects of the project were both its non-local character and close supervision by the investor's. The main innovative idea was to rearrange a diploma work into an architectural contest. Two groups of students were chosen to participate in the project - eight students from engineering and seven from Master's studies, along with their academic supervisors. Their final objective was to create a work meeting both the investor's expectations and the formal academic diploma requirements.

The subject was a revitalisation, expansion and land development for an existing historic hotel in Tyssedal, Norway, so the international aspect created an additional challenge for the students. Another specific requirement was the project's theme imposed by the investor. The project was called *The Wire* and this was a *leitmotif*, which had to appear in the idea or form in students' works.

At the first stage of the project, the investor organised a workshop in Norway. In October 2018, a group of students and their supervisors visited the hotel to see the project subject *in situ* and to familiarise themselves with the local geographical, geological and climate conditions. The location itself was very specific, with the hotel building surrounded by high mountains, overlooking a fjord. The workshop plan included also visiting the Norwegian Museum of Hydropower and Industry in Tyssedal, and other activities aimed to help students to understand the local specifics of the project. The investor's main idea was to use and expose the natural landscape values, while maintaining the highest technical standards of a modern, high-quality hotel facility. For four days in Norway, the students were working in groups with their supervisors, and at the end of every day there was a meeting with the investor, summarising the work completed. The investor presented his requirements, which were very strict, including the local context, financial aspects and a real possibility of its implementation.

After the workshop in Norway, the second stage was the students' individual work back in Kraków. For the next few months, the investor was visiting the FA-CUT once a month, meeting with the students and their supervisors. The Faculty of Architecture authorities were also present at these meetings, emphasising the prestige of the project. Apart from these monthly meetings, the students were in constant phone contact with the investor. The investor provided regular comments on students' works and ideas, corrected what he perceived as errors, and explained in detail his expectations, in order to avoid possible misunderstandings. The face-to-face contact with the investor and proper understanding of his mandatory requirements for the project, were crucial for the students. It was also a big change for them, comparing to standard diploma works. For the investor, not all the original concepts were acceptable and practically realisable, despite their formal excellence. On each stage of the work, the students needed to adjust and evolve their vision, taking into consideration the investor's comments. The investor graded students' work according to the following criteria: the most important was the revitalisation of the existing historic building, the second criterion concentrated on the idea of a new modern hotel wing, and the last one - on the expansion of the whole complex.

The students of engineering studies were preparing their projects for four months. They were defending their diploma works in February 2019. The students of Master's studies had more time, but also a more complex task to accomplish. They were defending their works in July 2019. Finally, 13 out of 15 students graduated successfully. The investor chose two winning projects – for engineering and Master's work.

Magdalena Przydział won in the category of Master's work. The investor admired the idea of combining the historic building with a settlement of modular apartments, located on the slope behind the hotel, built of prefabricated elements and linked by wooden terraces. The winning project was also best in reconciling the investor's expectations and criteria, with the formal requirements of the Master's work. In the category of engineering works, the project prepared by Damian Maj was chosen. The author was inspired by the industrial character of Tyssedal, combining the existing architecture with a contemporary response to the investor's idea of *The Wire*. This project, in the investor's opinion, exceeded the requirements of an engineering work. As a reward, both winners were invited to spend a week in the historic hotel in Tyssedal. Magdalena Przydział's project was also prepared for implementation, making it a significant point in her architectural portfolio, at the very beginning of her professional path.



Figure 1: D. Maj's winning engineering work for *The Wire* project.



Figure 2: M. Przydział's winning Master's work for *The Wire* project.

PROJECT EVALUATION

One year after the project's completion, an anonymous survey was taken among the students who took part in it. The survey consisting of seven questions was sent to all 15 students. Twelve responses were received, since two students did not finish the project (one from engineering and one from Master's studies), and one student from Master's studies decided not to take the survey. The aim of the survey was to evaluate the whole project from the students' point of view and from the time perspective, which allows to better assess its practical aspects.

The students were asked the following questions:

1. On a scale of 1 to 5, how do you rate the possibility of confronting academic knowledge with the requirements of the job market, during the studies?
2. Do you think that confronting a real investor is needed during the studies or preparation of the diploma work? (Yes/No)
3. Do you think that confronting a real investor has increased the difficulty of preparation the engineering/Master's work? (Yes/No)
4. Do you think that preparing the project for the international market has increased the difficulty of the work? (Yes/No)
5. Could you estimate the percentage of time needed to implement the investor's comments and corrections during the project's preparation?
6. On a scale of 1 to 5, how do you rate the consistency of the real confrontation with an investor with your idea of such co-operation?
7. On a scale of 1 to 5, how do you rate your general satisfaction from taking part in *The Wire* project?

The first group of respondents were the final-year engineering students. Engineering studies are the first stage of studies in a two-tiered system of education implemented in the FA-CUT [3]. The course duration is seven semesters, including 210 hours of internship: 120 hours of construction, 60 hours of architectural survey and 30 hours of an open-air drawing workshop. There is no design internship for students at the first stage of studies, so one can assume that the engineering students were less practically prepared for *The Wire* project. Also, the engineering students had less time to prepare their works (only four months), and the investor admitted that he paid more attention to the Master's students. The engineering students' answers to the survey questions are presented in the table below.

Table 1: Engineering studies - students' survey results.

Engineering studies							
Student ID	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7
1	3	Yes	Yes	No	30%	3	4
2	3	Yes	Yes	Yes	30%	4	5
3	3	Yes	Yes	No	55%	4	5
4	2	Yes	Yes	Yes	40%	3	5
5	5	Yes	Yes	Yes	50%	5	5
6	1	Yes	Yes	No	40%	5	5
7	3	Yes	Yes	Yes	70%	4	5
Average rating	2.8				45%	4	4.8

The second group of respondents were the final-year Master's students. Master's studies are the second stage of studies in the FA-CUT. The course takes three semesters, including 120 hours of architectural design internship, carried out outside the University in architectural studios. The investor's attention focused on the Master's students and they had more time to prepare their projects, but the task to meet both the investor's expectations and the formal requirements of the Master's diploma work was more difficult. The Master's students' answers to questions asked in the survey are presented in the table below.

Table 2: Master's studies - students' survey results.

Master's studies							
Student ID	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7
1	3	Yes	Yes	Yes	75%	5	5
2	3	Yes	Yes	No	40%	5	5
3	4	Yes	Yes	Yes	70%	2	4
4	5	Yes	Yes	Yes	50%	5	5
5	5	Yes	Yes	Yes	50%	5	5
Average rating	4				57%	4.4	4.8

The goal of the project was to respond to the students' need to go beyond academic education and implement a more practical approach, resulting in a better prepared graduate for the job market. The mean to achieve this goal was to change the form of preparing graduate work, implementing into this process the co-operation with an investor, which is a crucial part of architectural practice.

The answers to questions 1 and 2 show that the project met the students' basic expectations. All respondents answered positively that confronting a real investor is needed during the studies. In regard to question 1, the rating of the possibilities for confronting academic knowledge with the architectural practice is significantly low among engineering students. This rating is higher within the group of Master's studies graduates. It may be assumed that the reason of this difference is that Master's students need to take the above-mentioned 120 hours of architectural internship in the design studio. This gives them the practical design experience, which engineering students are missing, as shown in the survey.

The answer to the question if the project was adjusted to educational capabilities of the participants is not so clear. Two students did not finish their works, which means that meeting project requirements was too hard to complete it. Some participants pointed out in the survey that the difficulty level of diploma works realised within the project was increased.

All 12 students indicated the confrontation with an investor as a difficulty raising factor.

Eight students also answered positively to question 4, pointing out the international character of the project, as making the work more demanding. The average rate of additional time spent to implement the investor's comments and corrections was 45% among the engineering students, and 57% for the final-year Master's students. Students evaluated that half of the time needed for the preparation of their works was taken up by the direct co-operation with the investor. From this perspective, the diploma works realised within the project appear to be more difficult and far more time-consuming than the standard ones. Despite the significant increase of the difficulty level of the work, respondents' answers show that the real co-operation with an investor was consistent with their idea of how it would look like (average rating of 4 in question 6).

The answers to question 7, with an overall rating of 4.8 for the respondents from both groups, show that the students are satisfied with their participation in the project. They had the chance to gain practical work experience, which, in their opinion, is needed during academic studies. Also, they were given the opportunity to prepare their diploma work in a form more attractive for the job market, thus creating a stronger point in their portfolio than the standard work. This means that the general goal of the project was achieved. It also points out the gaps, which can be potentially filled by co-operation with an investor at the earlier stages of studies. The experience and skills gained by the students participating in the project are strictly practical and required for the architectural practice, which leverages the graduates' position on the job market.

The originality of the project is based on change in graduate work, which is a critical element in architectural education. This factor distinguishes *The Wire* from other partner programmes realised in the FA-CUT. The partner programmes are special events, and students' works prepared within these programmes are realised on the margins of the main study course. *The Wire* project affected the core element of academic education - the graduate work - changing its form from a single test of acquired knowledge, into a real architectural work experience.

Figure 3 and Figure 4 below show the differences in the process of preparing a standard graduate work and a graduate work within *The Wire* project.

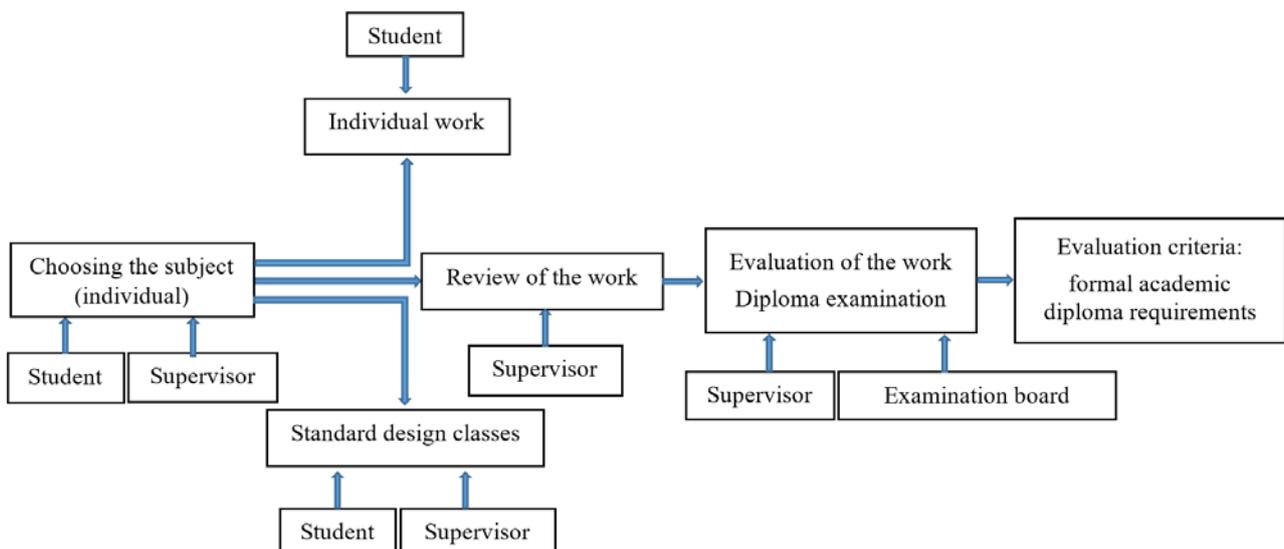


Figure 3: Standard diploma work scheme.

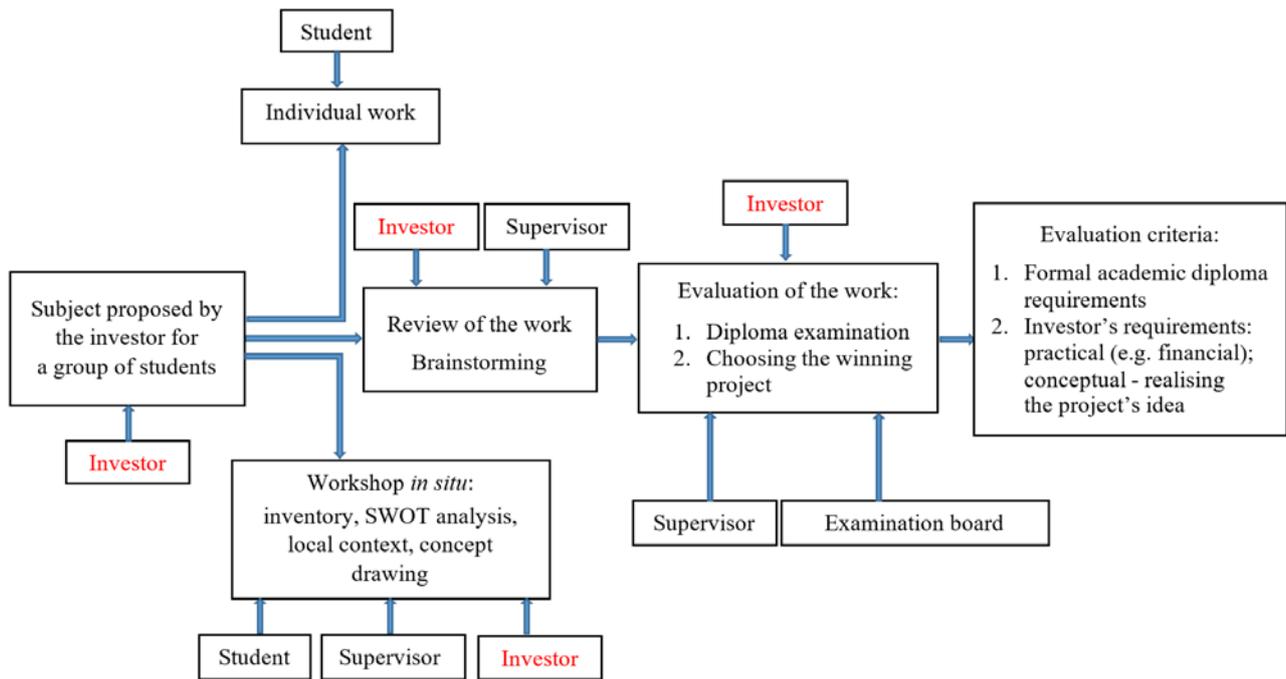


Figure 4: Diploma work realised within *The Wire* project scheme.

As shown in Figure 3 and Figure 4, the process of developing graduate work within *The Wire* project involves the investor's participation at all stages, from the introduction of his own subject until final evaluation. The process of designing goes beyond academic classes and involves the actions typical for architectural practice. An additional aspect is the competition, as a group of students work on the same subject. The final work is graded not only by the academic examination board, which checks whether it meets all the formal requirements, but also by the investor, who chooses the project best meeting his own expectations. In this form, the process of developing graduate work reflects the process of developing a real architectural project for a specified recipient. This provides the graduates with the experience closest to their future work, meeting their expectations for a more practical approach in academic studies.

CONCLUSIONS

The aim of architectural education at the tertiary level should be not only to educate students properly, but also to prepare young professionals to find their place in the job market. In the course of studies, it is necessary to combine the acquisition of theoretical knowledge with skills and experience in the practical side of the profession [4][5]. As shown by the survey results, it is also highly required by the students themselves. Unfortunately, the Polish education system, in general, lacks this practical aspect, so it is important for university entities to support all individual initiatives, challenging this situation. Potential employers expect graduates to have practical professional experience even more than theoretical knowledge. Such practical experience can only be gained through real-life participation and involvement in architectural design. In this respect, the FA-CUT, appears to be at the forefront of architectural education in Poland.

Since 2000, the FA-CUT, has the Royal Institute of British Architects (RIBA) accreditation (as the only one academic centre in Poland), in recognition of the high educational standards. For years, the Faculty authorities have continuously endeavoured to engage students in co-operation with local governments and commercial enterprises, resulting in many interesting partner activities and ventures [6]. Students are always encouraged to take part in both international and local architectural competitions [7]. The University also implements special programmes and organises workshops [8] aiming at improving students' professional competencies [9].

In this context, *The Wire* project is a showcase, because it is not only another partner project, realised apart from the main study course, but an experimental project affecting one of the main elements of academic education, which is the graduate work. It has changed the process flow and the diploma work's requirements, involving the investor and architectural contest. The development of graduate work within the project reflects the actual architectural practice, including the final output.

The study taken by Gyurkovich shows that the main criterion for choosing the subject of diploma work by students is its potential attractiveness in their future portfolio [10]. However, diploma candidates rarely decide to choose a project for any external competitions, because it is difficult to find a subject that would meet the requirements of a Master's work.

With *The Wire* project, the students had the opportunity to develop a real project dedicated to the international market, confronting their knowledge acquired during the studies, with the existing investment conditions and the expectations of

a demanding investor. According to the survey results, this aspect increased the level of difficulty and the amount of time spent to prepare the diploma work (on average by a half). Despite this, both the engineering and Master's students evaluated the project positively, as meeting their expectations regarding the introduction of practical experience into academic education. As a result of their participation in the project, the students had the opportunity to find out how the real design process, involving the co-operation with the investor, looks like, and the diploma works prepared within the project have become a strong asset in the graduates' portfolios.

The investor was also satisfied with the result of this experimental project, breaking the routine of hiring experienced architects from renowned design studios. He appreciated the students' fresh, innovative ideas, their devotion to the project and openness to suggestions. The investor also praised the effective co-operation with the Faculty of Architecture authorities.

The positive feedback by the students should be encouraging for the FA-CUT authorities. The students showed their willingness to take part in changing the core elements of the established academic process, aimed at bringing the academic learning environment and the realities of architect's work closer together.

Creating opportunities for students to be involved in practical architectural design is crucial to the educational outcome at the postgraduate level. Initiatives, such as *The Wire*, show that change is possible even at the most established educational stages. The first completed project opens the possibility of organising more graduate work in this new form, to better prepare and introduce young architects into their professional career.

REFERENCES

1. Peters, L., Dyplomy pachnące fiordami. *Nasza Politechnika*, 10, **194**, 26-28 (2019) (in Polish).
2. Wydział Architektury Politechniki Krakowskiej, Wydział Architektury Politechniki Krakowskiej, Kierunek Architektura, Standardy Kształcenia dla Kierunku Studiów: Architektura (2014), 15 February 2020, <http://arch.pk.edu.pl/studia/kierunek-architektura> (in Polish)
3. Paprzyca, K., A model of co-operation for the city of Nowy Sącz in projects and student compilations. *World Trans. on Engng. and Technol. Educ.*, 16, **2**, 173-178 (2018).
4. Siedlecki, B., Experience in technical education: the organisation of practical construction training for students in a faculty of architecture. *World Trans. on Engng. and Technol. Educ.*, 16, **1**, 65-69 (2018).
5. Puig-Pey, A., The architect: training, skills and professional practice. *ACE - Architecture, City and Environment*, 12, **34**, 301-320 (2017).
6. Paprzyca, K., An innovative model of co-operation between university, local government and business in the Faculty of Architecture at Cracow University of Technology. *World Trans. on Engng. and Technol. Educ.*, 15, **4**, 404-409 (2017).
7. Zaprojektował bazę na Marsie, doceniono go w Kuala Lumpur. *Nasza Politechnika*, 9, **193**, 14 (2019) (in Polish).
8. Markiewicz, P., The role of international student workshops in the process of educating architects - *Integrated Energy Design. Global J. of Engng. Educ.*, 19, **3**, 256-261 (2017).
9. Paprzyca, K., Competencies' benefit for graduate architects. *World Trans. on Engng. and Technol. Educ.*, 16, **4**, 434-440 (2018).
10. Gyurkovich, M., Preferences in Master's in Architecture diploma project subject selection - experience in the education of *Engineer Architect* degree holders. *World Trans. on Engng. and Technol. Educ.*, 18, **3**, 330-333 (2020).