The role of remote teaching platforms in architectural education

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ABSTRACT: In traditional education the class time available for workshops and lectures is limited. Students always should have opportunities to expand their knowledge in their chosen field and there are students who want to invest more time in gaining new skills. For these reasons, at Cracow University of Technology, Kraków, Poland, course material and exercises for students can be made available through an on-line education platform. The Internet is changing the ways of learning and on-line platforms make up-to-date knowledge always available to students. Various learning environments are available through the on-line platform. Educators can upload training materials; for example, a movie, a presentation or various exercises. Contemporary education has to be dynamic and interesting to gain students' attention. The e-learning framework (ELF) is based on a Moodle learning platform and is in use in the Faculty of Architecture at Cracow University of Technology (FA-CUT).

INTRODUCTION

Common access to mobile technologies and modern communications increases the possibilities for exchanging information; digitisation has a significant impact on shaping the environment of work and study. Education as a process primarily is about an exchange of information. In many subjects contact between lecturers and students is essential; for example, during experiments or measurements in the laboratory where senses beyond sight are involved. In these examples, students may watch a demonstration of an experiment, and then perform the experiment receiving frequent feedback.

During painting and drawing workshops, lecturers and students work with various media; it is easy to brainstorm solutions. Current technology makes it possible to create on-line classes involving various senses.

ON-LINE EDUCATION

Conducting e-courses is a modern form of education. The impact of on-line education has been analysed based on drawing class workshops. Since the student chooses the time and place for a class, teachers must change educational paradigms to accommodate it by exploiting the educational potential of today's technologies. Virtual classes supported by e-learning offered by universities are developing rapidly.

ACTIVITIES AT CRACOW UNIVERSITY OF TECHNOLOGY

The benefits of on-line education platforms, based on practical experience of the e-learning framework (ELF) Moodle-based platform, is presented and discussed in this article. Advantages are described for both educators and students. According to Professor Jacek Gyurkovich, Dean of the Faculty of Architecture at Cracow University of Technology (FA-CUT):

> *The goal of teaching the art and skill of design is to prepare students, future architects, for making independent design decisions concerning the shaping of architecture and the associated open spaces to satisfy the needs of individuals and social groups* [1].

One of the most important skills for students is to learn to work independently. The working conditions and requirements of employers are changing, and graduates often must organise themselves in a dynamic and unpredictable work environment. Students must learn to be an independent and proactive worker to participate in the global labour market. Hence, remote teaching platforms may enhance further career opportunities for the students. Students who want to invest more time in gaining new skills have the possibility to fulfil this ambition at the FA-CUT.

On-line learning has been used successfully for freehand drawing. The tradition of the Division of Freehand Drawing, Painting and Sculpture at the FA-CUT is multi-form and diverse. Freehand drawing always has had an essential role in the teaching of architecture. According to Professor Andrzej Białkiewicz, Head of the Division of Freehand Drawing, Painting and Sculpture:

…generally drawing and painting classes in the faculty of architecture are taught in order to develop one's architectural background. When it comes to teaching basics, we can even talk of an academic approach of a certain kind. But the main aim is to develop the student's spatial imagination and, simultaneously, letting him/her gain experience in conscious and objective perception of the spatial phenomena - those that already [exist], as well as the ones [that] are still being designed [2].

Spatial imagination cannot be learnt during one workshop. Students must invest their time to gain these skills. Good perception of space is a fundamental skill for architects. The predispositions of students in terms of shaping architectural space, have to be developed. To achieve these goals communication is fundamental, because architects always need to communicate their projects and ideas.

Architectural ideas and concepts can be presented with:

- technical drawings;
- 3D perspectives;
- sketches;
- models.

In many architectural competitions 3D perspectives are a key element in presenting architectural work. A designer can show the *atmosphere* of a project, which can never be shown on technical drawings. Computer-based techniques and technical drawings are only representations of the ideas and imagination of the designer.

The author's design experience of architecture has resulted in the incorporation of new methods of how architects and clients communicate. The author of this article has taken part in many multinational competitions, winning several first places. In the early phase of design the visualisation of architectural space is an important research topic investigated by the author. During design the role of sketches is underestimated; this is the most important factor in creating a good design solution. Sketching allows creative thinking without the fear of making mistakes.

During project development sketches change into well-presented 3D perspectives with more detail. Many architectural competitions are won by good quality visualisations and drawings. It is important that the designer chooses the right way to present work. In the FA-CUT, students learn how to present their work in the best way for each design topic.

SUBJECT

The research investigated how students' active participation in classes develops their skills and prepares them for independent work in their profession. There were in the research:

- 225 students;
- 6 teachers;
- 5 topics.

METHODOLOGY

The research presented here is based on a freehand drawing e-course. The students who took part were in first year and the second semester in the FA-CUT. The course focuses on important aspects of architectural studies, i.e. creative work with painting and drawing for first-year students, thus developing their imagination.

FEEDBACK

After taking part in the course students were asked about this way of teaching and communication. Teachers also shared their experience. The effectiveness of e-learning was measured by students' activities on the on-line platform.

THE REMOTE TEACHING PLATFORM IN THE FA-CUT

An on-line platform offers an effective method of communication between students and teachers. To participate in the course, students need a computer and access to the Internet. For freehand drawing classes students use traditional methods of drawing. These are photographed, scanned into the computer and communicated to teachers via the Internet.

General communications are available through the on-line forum. For example, problems can be reported on the course forum, with teachers suggesting solutions. Students, once familiar with the platform environment, are not afraid of making mistakes. Students, of course, may not delete any e-course material.

Teachers may share information with all students or with only one, e.g. grades, and comments on work are seen only by the relevant student, whereas general course announcements would be available to all.

The e-learning system called ELF is based on the Moodle platform used by the FA-CUT and is divided into sections. These are:

- Activities;
- Resources; and
- Forums.

Activities most commonly used are:

- Lessons - content may be presented across many pages. Each page usually ends with a question and several answers. Depending on the progress of the student, they (the student) redo the material or proceed to the next page.
- Tests (quizzes) - these are multiple choice or true-false. Each answer by a student is evaluated automatically, and the teacher can decide how to display feedback.
- Assignments - these are submitted by file. The teacher can post comments and upload general feedback. The grade awarded can be a numeric or another scale (e.g. alphabetic). Ratings are placed in a grade book, but each student can see just see their own grades.
- Glossary - a list of definitions and information resources, i.e. a *dictionary* for the topic.

Figure 1 shows an example of student activity on the Freehand Drawing course (activities are defined below).
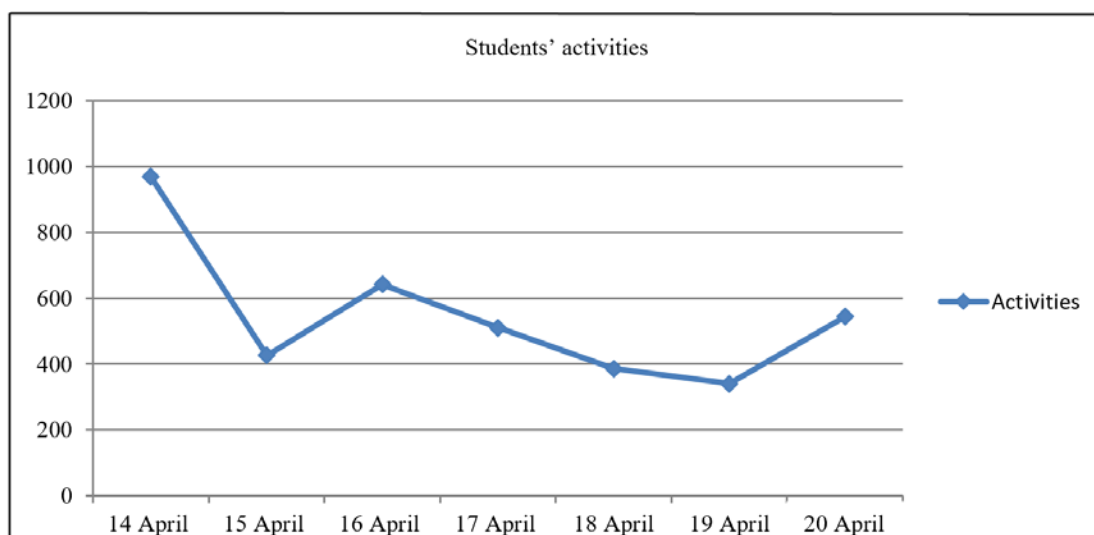

Figure 1: Freehand drawing lesson activity diagram (14 to 20 April 2020); 225 students, year 1, 2nd semester (diagram by Author).

This example shows how good organisation increases students' activity. In this course, 225 students were enrolled. In this example, it can be seen that, at the starting point of one task, there were almost 900 activities by students. Activities included viewing the task, sharing questions and reading resources provided by teachers. Students then work on the current topic, e.g. uploading work to teachers. During this time the number of student activities per day was between 340 and 620.

It is important to maintain student attention, as revealed by activity in the current task. Teachers provide this environment with good quality communication and quick feedback. When working with students it is also important to provide an atmosphere that helps learning:

> *...the way to increase and sustain people's creative performance is to provide an environment that encourages them to develop expertise, and maximize their motivation. This environment is one which simultaneously builds student confidence. It is this environment that is central to the organisation of this first year course* [3].

Resources most commonly used are:

- URLs (Uniform Resource Locator) - a link to an external Web pages, documents or images.
- Labels - text and images on the course page.
- Files - added to the resources available, accessed by forced download.

A forum is a communication platform between students and teachers. Descriptions of interesting information will be provided to students when they enter the forum. Each person can ask questions or share information; technical problems can be discussed in the forum. Teachers collect most frequently asked questions (FAQs) to address the topics students have most problems with; the teacher develops an FAQ site.

The teacher can decide the type of forum required:

- Question and answer - the teacher asks students a question; until they submit their answer they are unable to see the answers sent by other students.
- Standard forum - lecturers and students can post information and reply to posts.

The standard forum is displayed as a multi-topic forum in which the first post appears larger. Anyone may send a topic for discussion: every student can continue the discussion on a topic.

COURSE LAYOUT

All activities and resources are available to teachers in setting up an e-course. The Freehand Drawing course for first-year students at the FA-CUT is divided into sections (Figure 2). The first section includes the introduction specifying requirements to pass the course.

a)   b)
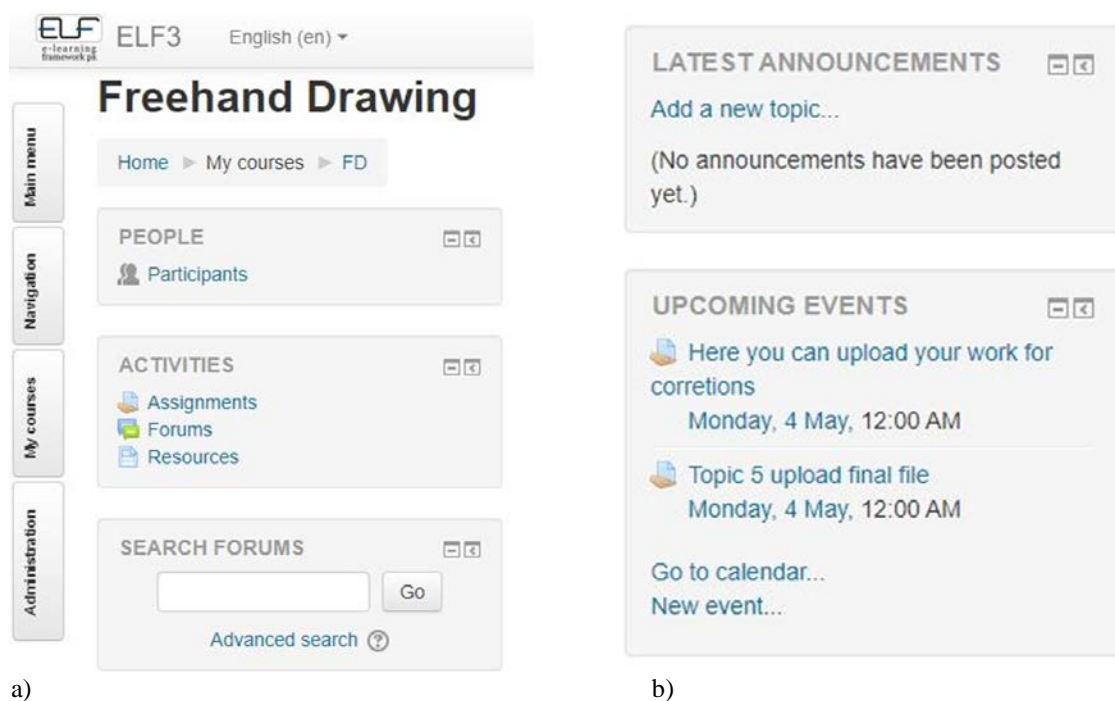
Figure 2: a) and b) E-course layout, first page (Screenshots from ELF Moodle platform used at the FA-CUT by Author, 2020).

The first section includes:

- Introduction;
- Teachers;
- Timetable;
- FAQs;
- Forum.

The second section includes useful links and guidance on the student work. The Freehand Drawing course has links to famous architects, with sketches and paintings to act as an inspiration for the students.

The third part is composed of tasks set by teachers. These tasks provide a step-by-step approach to gaining knowledge and experience. E-course education in the field of architecture must be designed flexibly:

Transparency, flexibility, adaptability, quality, openness, creativity, innovation, mobility, experimentation, diversity, compatibility, comparability, parametricism, employability [appear] to be already established values which demand new strategies, new actions and new approaches to the structure of school curricula in order to respect the contemporary definitions of quality in architectural education [4].

RESULTS AND CONCLUSIONS

There is sensitivity in the Division of Freehand Drawing, Painting and Sculpture in the FA-CUT to trends and the skills needed in the workplace.

> *Learning architecture is a rather complicated matter, because it is a combination of theoretical and practical knowledge. Schools of architecture with their limited flexibility must constantly react to the transformation of the architectural profession* [5].

This opinion underlines how important it is to constantly improve the teaching. The results of the e-course run by the author identified the advantages as seen by students and teachers.

The main advantages of creating e-learning courses, according to students, are:

- Students choose the time and place to work on tasks.
- A quick and easy-to-use communication platform is provided.

The main advantages, according to teachers, are:

- Students learn to work independently.
- Students can work easily work in groups.
- A quick and easy-to-use communication platform is provided.

The main advantage of the e-learning platform is this: it provides for quick and easy-to-use communication, and is not time-limited as it is with *regular* classes.

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