

EXPERIENTIAL LEARNING. DEVELOPING STUDENTS' RESEARCH SKILLS USING THE INTERNET

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Abstract: *Experiential learning is helpful for undergraduate students as it helps improve their theoretical knowledge and develop research skills. This article seeks to presents the benefits of experiential learning in the context of the higher-education environment. Through this method we wanted to investigate to what extent such a theme could highlight and develop students' research skills. The method suggests a positive constructive feedback from both, teachers (colleagues) and students. Based on this feedback we consider the method information-specific, because is transferring the theoretical aspects or ideas into real products. This study establishes a platform for future implementation possibilities at a different scale for the method, for undergraduate students.*

Key words: *experiential learning, undergraduate students, research, educational development.*

1. Introduction

In academic environment the tendency to state and to maintain high standards is correlated with academic achievement and seen as a factor that can motivate the student to strive for excellence [1]. Since the establishment of the human capital investment theory in the early 1960s, higher education is generally recognized as a critical investment for a country, especially for a developing country's long-term social and economic development [2]. As the presence of online and hybrid coursework at institutions of higher education has increased, so too has interest among educators and scholars in understanding personal and contextual

factors that predict success in different types of learning environments [3]. Teaching is a complex process, demanding special human qualities [4]. More recently, the education aid policy debate has gradually shifted from access to schooling to improving learning quality. The transition is likely to dominate the post-2015 global development framework for education development, and can be explained by two important factors: firstly, growing evidence emphasizes that quality of education is what matters for economic development [5]. Acceptance of innovations - the reception accorded to new ideas of changes in practice - is of great significance in the study of development. This is so if we think of

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development in the restricted quantitative sense of economic growth, for many projects and schemes depend upon the take-up of some change in practice which will (it is hoped) lead to increases of wealth or productivity. It is also very much the case if we think of development in the broader sense of improvement in the quality of life, since many innovations are aimed at qualitative amelioration of the conditions of life [6]. Negovan and Osiceanu suggest that if the progress in learning is assessed by the knowledge development, the students must to be involved more in activities focused on knowledge, based on an analytical strategy and aiming Bloom' learning objective "application" [7]. Students working in small groups, usually consisting of five to seven students, that communicate and learn from each other and are actively engaged with the course materials is defined by literature as Team-based learning. Team-based learning (TBL) is an active learning-centered teaching strategy that employs small groups to offer an alternative to traditional lecture classes [8]. Students of today are digital natives. They acquire their digital literacy autonomously and are adept at using various Information and Communication Technology (ICT) tools to enrich their daily leisure life [9]. Higher education has been impacted significantly by the proliferation of online instruction¹⁰.¹⁰ E-learning has been used very widely to offer solutions in higher education in accordance with the demands of the knowledge-based society [11]. The worldwide trend toward lifelong learning assumes that learners need to be more independent and well self-controlled and self-regulated in order to achieve desired learning goals. Tertiary students are expected to be self-regulated learners, as most of the learning tasks were completed with less supervision from lecturers or tutors compared with primary and

secondary teaching modes [12].

2. Methods and Procedures

With this study we want to draw attention to a method of learning that combines team-based learning (TBL) with e-learning environments, with Information and Communication Technology (ICT) tools and with practical experiment. We used for this study experiential learning, because the aim of our project was to convert an idea into a real product. We did this helped by two undergraduate students.

2.1. Participants

The participants in this project were two undergraduate students (Bucur Irina and Posea Gabriel), enrolled in the first year in Building Services specialty, Faculty of Civil Engineering, from Transilvania University of Brasov. We chose students from the first year, because they have less knowledge in the field of building services, automation and we considered this aspect more relevant for the study.

2.2. Procedure

Every year in our University we have a Students Scientific Communications Session where each specialty from each Faculty has to nominate students to present different communications in the field they are enrolled. Students use MS Power Point presentations for this purpose. This year, we (the authors of this paper) we wanted to try a project that enables students to start with an idea and accomplish something practical and present the result in the Scientific Session.

2.3. Research Instrument

The theme for the students was to create an air temperature-humidity portable

datalogger, using electronic components ordered from the Internet and tutorials to create it, from blog sites and e-learning portals. The students have been instructed not to get help from other colleagues and if they have any questions to ask one of us. Based on our idea, first the students have started collecting information about the different components of the datalogger. After this step, they ordered the parts from a Chinese website and wait for the components more than one month. From the moment they had the essential components they had another month to finalize the product and present their result in the Scientific Session.

2.4. Evaluation Method

To collect and analyze reliable and usable data about our project we chose to take surveys, for the first and the last of the three components. These surveys help us ensure and enhance the quality of students' learning experience.

The colleagues of the two students were asked to fill a 15 statements survey. They were asked mostly questions about the impact of using the Internet in the learning process and in their professional development.

3. Results

Whether we speak about face-to-face learning or about online learning system or about learning through practical experiments or about a mixture of these, we need a viable learning system. Face-to-face learning is the expression of traditional educational system, where learning take place as an interaction between teacher and learner or a learning group. This characteristic is minimized when online learning system is used, because the teacher only assists the students in the achievement of their

learning objectives. Other characteristics specific to online education are:

- The use of ICT, to achieve the purpose and to facilitate the communication between student and teacher;
- Provision of student support and learning materials off course;
- The partial or total absence of the extended learning group;

A central pedagogical feature of any educational system is the provision of questioning and feedback. That is why we used surveys to evaluate the feedback of our method. As a general impression, the student satisfaction with the quality of their entire educational experience has remained consistently high, across all survey categories.

3.1. The Final Product and the Presentation

The proof of a concept or an idea, is the prototype, but from idea to the final product is a long way. The process of going from concept to prototype include passing through research and gather information, materials procurement, product design development, prototype testing, manufacturing, assembly, feedback and testing. There was no exception in case of our student's project. In Figure 1 are presented three important steps, material procurement (Figure 1.A), manufacturing (Figure 1.B) and the final product (Figure 1.C)

Creating a good Power Point presentation is the first step to express an idea with power, persuasion and charisma. But the most powerful method for conveying an idea it is not related necessarily to presentation itself, but to the oral presentation. The combination of the two can lead to an extraordinary communication which can turn into a

passport to success.

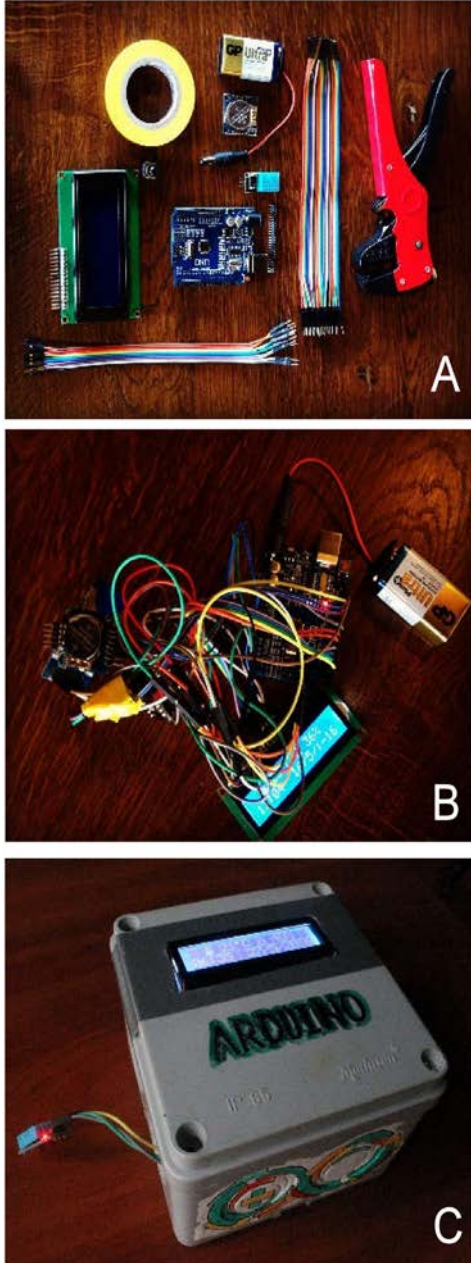


Fig. 1. *Three important steps to pass from concept to the final product*

In case of students the skills of communication vary from one student to another, depending on their experience, their motivation, etc. The truth is that people communicate these days more than

ever. The Internet offers a variety of communication methods, in so diverse mediums. We can instantly share photos, post news stories, and just chat with friends, family, and colleagues from anywhere in the world with an Internet connection.



Fig. 2. *A snapshot during the students' presentation*

For their presentation, the two students prepared a 15 slides Power Point, because they got instructed that the oral presentation last no more than 10 minutes or 15 minutes including the questions from the audience.

Besides their presentation in the session were presented another seven scientific papers. All student presentations were interesting, but the work of the two students was more popular and immediately drew everyone's attention.

3.2. Students' Evaluation of Their Learning Experience

Students must acquire knowledge, but the learning process has to be diversified and updated. Based on the project results we might say that student living in a digital world need a new set of skills: digital literacy, team-working, online and offline communication, entrepreneurship,

leadership and problem solving, as shown in Figure 3.



Fig. 3. Skills student living in a digital world need

3.3. The Evaluation of the Impact of Using the Internet in the Learning Process, Done by their Colleagues

Information and communication technologies (ICTs) have got still very impact on the teaching-learning process, their effect was also in the past at the beginning of the century, when Richards, (2005) wrote, that many teachers find that interesting and well-planned tasks, projects, and resources provide a key to harnessing the educational potential of digital resources, Internet communications and interactive multimedia to engage the interest, interaction, and knowledge construction of young learners.

To evaluate the impact of using the Internet in the learning process in case of our project, we conducted a survey that embodied 15 questions. The description of their positive or negative experiences has been done in this case on a six-point scale (ranging from 1 “Strongly disagree” to 6 “Strongly agree”). In this survey participated 23 students. As can be observed in Figure 4, the results in the

survey indicate that the Internet is not a difficult technology and most students agree the Internet can be an efficient tool for learning and useful for their professional development. In the same time most of the students consider practical training important for their career and agree (43.5%) and strongly agree (47.8%) they learn faster if they do a practical experiment.

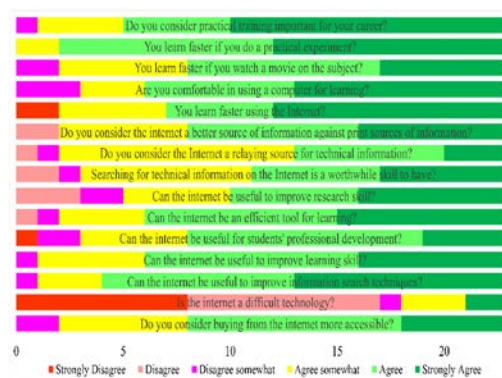


Fig. 4. Survey results for the impact of using the Internet in the learning process

Digital competences gained in specific courses are now part of any student’s development. What we do not know yet is on what level teachers accept and integrate ICT in other courses. There are a few factors that influence ICT integration such as teacher’s experience and skills with ICT, his attitude on ICT, his perception on the help brought by ICT for the student’s academic development.

4. Conclusions

Young people spend much time on the Internet, and many studies say that in today's world spend too much time in front of computer and time consumed outdoors or for recreational purposes decreases. What we need is to find ways to harness the time spent by students in front of the computer, on the Internet, for their

academic development. To succeed learning from online environments, students need motivation, self-regulation and remote assistance.

In this paper, we present an experiential learning method applied in case of two students enrolled in the first year in Building Services specialty, Faculty of Civil Engineering, from Transilvania University of Brasov. The students built a prototype of an air temperature-humidity portable datalogger, using electronic components ordered from the Internet and tutorials to create it, from online environments. Students experienced an active and authentic way of learning, by moving from idea to something practical, from the real world.

We used surveys to evaluate the feedback of our method. As a general impression, the student satisfaction with the quality of their entire educational experience has remained consistently high, across all survey categories. The students embraced the opportunity to participate in a competition, to develop new learning skills and to strengthen their knowledge.

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