IMPLEMENTING SP4CE LEARNING ROOMS CONCEPT AND AUTODESK ONLINE CERTIFICATION IN THE PREPARATION OF A NEW GENERATION OF ENGINEERS

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Abstract: *In academia, educators do not always cope with rapidly changing technologies. Yet keeping up with new trends is essential to graduates' success in a competitive job market. In the article, the author will answer the question of how Autodesk University Open Educational Resources and Certiport exams including GMetrix can enhance students' academic progress and prepare them for future career. The concept of co-operation between Authorized Autodesk Training Centre at Gdansk University of Technology and Faculty of Management and Economics will be proposed based on experiences gathered in the ERASMUS+ SP4CE project.*

Keywords: Autodesk, SP4CE, e-learning, certification, culture of participation

INTRODUCTION

E-learning courses at Gdansk University of Technology have come a long way from being plain file repositories to environments that enable learning through interaction with highly qualified instructors and other course participants. Students can develop skills with sample exercises that emphasize real-world applications (TeleCAD, SP4CE). They can also work simultaneously on a group project that is stored in cloud (Fusion 360). Before taking an exam and earning a valuable certificate of completion that is recognized in an engineering profession (Open Doors, Certiport), students can prepare themselves by taking part in online trail exams (GMetrix). In the article the model for supporting online certification at the ACSA PG is proposed. In order to build the model mixed method research (quantitative and qualitative) was used.

1. HISTORICAL BACKGROUND

1.1. The pioneers of e-learning at Gdansk University of Technology

Implementing e-learning at Gdansk University of Technology started from a TeleCAD project (Teleworkers Training for CAD Systems' Users). The idea of the TeleCAD course evolved from an AutoCAD course delivered since 1996 in Open Distance Learning mode for students from Civil Engineering Department at Gdansk University of Technology. The TeleCAD project was co-financed by the European Union Leonardo da Vinci Programme and developed by Gdansk University of Technology in co-operation with four institutions from Greece (IDEC, ZEUS), Finland (Pekkala Software Oy), Italy (ARGO) and Poland (Young Digital Poland S.A.). The project had two main objectives. First, it had to develop a Learning Management System (LMS), which is an online platform for preparation and delivery distance learning courses. Secondly, to use this newly created environment to produce an AutoCAD training (Grabowska, 2001).

The course materials consisted of 10 modules that covered basic skills of drawing in AutoCAD. Every module included a set of exercises with description of an appropriate solution. Course materials were prepared as HTML pages available both on and off-line. The participants had to hand over the final project sending it by e-mail through LMS TeleCAD to the assigned instructor. To prove authorship, students were asked to make changes in their projects in the presence of the instructor. At the end of the training participants filled in survey questionnaires to assess the quality level of materials, instructor's knowledge and commitment, the amount of acquired knowledge and skills, course organisation, etc. (Grabowska, 2014).

TeleCAD was an inspiration for implementing distance education and blended learning at the Gdansk University of Technology. Not only was it used to teach AutoCAD, but also for examining students in the Basics of Computer Science and as support environment for students of Faculty of Civil Engineering at the Gdansk University of Technology. By 2002, more than 1000 students used it. In 2003, TeleCAD was replaced by Moodle due to sustainability reasons (Grabowska, 2003; Grabowska, 2012).

1.2. A difficult road towards certification

Authorized Autodesk Training Centre at Gdansk University of Technology (ACSA PG) was established in 1995. In 2002, ACSA PG added AutoCAD to its course offer. Even though they were not free of charge, online AutoCAD training courses became quite popular. Between the years 2003 and 2017 ACSA PG issued 1802 AutoCAD certificates as shown in Table 1.

Table 1.

The number of participants of Autodesk certifications between 2003 and 2017

Year	AutoCAD	3D Max	Revit Inventor Fusion 360	Total number of certificates
2003	90			90
2004	91			91
2005	151			151
2006	216			216
2007	301			301
2008	180			180
2009	91			91
2010	100			100
2011	88			88
2012	137			137
2013	118			118
2014	69	4		73
2015	64	11		75
2016	46	3		49
2017	60		54	114

Source: Own work

The small offer of ACSA PG certificates has been gradually expanding. Since 2016 ACSA PG has had a statute of the Authorized Academic Partner, which means that for educational purposes participants can have a free access to Autodesk's design software, creativity apps and learning resources (Autodesk University).

In 2017, Autodesk Open Doors was held at the Gdansk University of Technology. The event was related to conducting a series of examinations from individual Autodesk programs: Autodesk Certified User (ACU) or Autodesk Certified Professional (ACP). If they passed, students received certificates issued by Certiport. Established in 1997, Certiport has a network of over 14,000 Authorized Testing Centers in 148 countries and is a world-recognized certification brand. Among Certiport's associates are Microsoft, Adobe, Autodesk and Quickbooks. Organization of the Autodesk Open Doors 2017 required the cooperation between Autodesk Authorised Academic Centre, Faculty of Management and Economics with representatives of Autodesk as well as institutions like Certiport that deal with

online certification. Preparations for the exam took place in a specially prepared learning room on the SP4CE platform. The examinations were carried out in the computer laboratories of the Faculty of Management and Economics of the Gdansk University of Technology under the supervision of proctors. The experience gained during Open Doors event were helpful for establishing a broader cooperation with the institutions responsible for ACU and ACP certification and developing a plan to conduct a series of exams for a greater number of instructors and students.

Owing to the Autodesk course offer students have a chance to familiarize themselves with important software solutions that are not included in their formal academic study programme. Through Certiport, their hard-earned certificates will be widely recognized in industry. Unfortunately, as can be seen in Table 2, learning independently is challenging and does not always lead to gaining a certificate.

Table 2.

Examination results between 1st November 2017 and 18th July 2018

Exam	Number of passed attempts	Number of failed attempts
Inventor Certified Professional Exam		1
3d Max Certified Professional Exam		1
Certified Professional: Revit for Mechanical Building Systems - Metric Exam	1	
Autodesk AutoCAD Certified User Exam	2	
AutoCAD Certified Professional Exam	4	2
Fusion 360 Certified User Exam	1	1

Source: Own work

1.3. The concept of Learning Rooms - a space created for learning

Traditionally LMS was always administered by the institution without leaving too much autonomy to students. However, learners should no longer be perceived as merely information consumers. The passive methods of lecturing do not promote skills that are highly regarded in real life such as: problem solving, critical thinking and creativity. In virtual "knowledge rooms" rather than just accumulating knowledge, students learn how to manage it (Weigel, 2001). Learning is moving from the classroom into individual's space making it a more personal experience. In a Personal Learning Environment (PLE) students actively use social media such as Facebook, Wiki, Google Calendar, blogs etc. to seek, create and share knowledge (Dabbagha et al., 2012).

The concept of using LMS as PLE was utilized in ERASMUS+ SP4CE project. SP4CE stands for Strategic Partnership for Creativity and Entrepreneurship and addresses directly aims and needs on enhanced European cooperation in vocational education and training. The project was funded with support from the European Commission under the ERASMUS+ Programme (1.09.2014 - 31.08.2017). Project's activities were connected with career-oriented continuing VET (C-VET) principles. All project results and actions are connected with promoting take-up of innovative practices in education, training by supporting personalised learning approaches, collaborative learning and critical thinking, strategic use of Information and Communication Technologies (ICT), Open Educational Resources (OER), open and flexible learning, virtual mobility and other innovative learning methods. The SP4CE portal provides space for problem solving, answering questions, creation of the teams which want to work towards the problem solution, work for teams or individuals to develop the solution, mentoring and coaching, presentation of developed solutions, publishing of the chosen solution (Grabowska et al., 2015; Grabowska et al., 2016; Czaja et al., 2017; Czaja et al., 2018). Learning Rooms work as SPOCs (Small Private Online Courses) where each room is dedicated to different problem with limited number of users (Sanchez-Gordon and Lujan-Mora, 2014).

In the period from March 27 to June 7, 2017 ACSA PG in cooperation with a training company called SchemOUT (http://www.pozaschematem.pl/) offered seven courses in blended learning mode (including AutoCAD, Revit, and Inventor) to Gdansk University of Technology students. Both organisations have a statute of the Autodesk Authorised Academic Partner. ACSA PG carried out the process of student evaluation and certification. SchemOUT was responsible for delivery traditional courses. During the training, students were required to actively participate in classes and to archive their work in a dedicated Learning Room. After completing the training, students had one month to complete their Learning Room portfolio to take part in the certification process carried out by ACSA PG instructor. The process of individual evaluation and certification began on June 12, 2017. From 96 students who qualified for the certification process. 65 students got certificates of completion.

2. A PROPOSED MODEL

In 2017 face to face interviews with students were held. Statistics such as number of passed exams, number of retaken exams etc. were analyzed. A model for supporting online certification at the ACSA PG was created. As shown in Figure 1 model depends on SP4CE Learning Rooms acting as a gateway for information passage between system users.

From the organizer's point of view it is difficult to gather a sufficient number of participants, establish an exam date that fits everyone and give support to student's need to successfully finish the training. All these issues can be addressed by

creating dedicated Moodle Learning Rooms. Each Learning Room should be aimed at specific exam. Users will enrol without extra effort on the organizer's part. Once the sufficient number of interested parties is ensured and all formal requirements are met the learning room can be set to private. The date could be established by voting. Important data like learning materials, dates, etc. will be stored in the Learning Room space. Managing information flow would be easy since all participants' contact information will be kept in one place.

Since preparing for the exam is crucial, all users will be offered access to Autodesk University resources. Dealing with the vast number of learning materials in the limited time learners have is challenging. To solve this issue students will be encouraged to share the best Autodesk's content in their Learning Room for everyone's benefit. Uploading their own work, discussing different solutions and sharing materials from different sources (YouTube, Google, etc.) will be encouraged, since research has shown that active learning approach is essential to maintain high level of engagement (Fisher, 2010). Learning Rooms will become cMOOCs reinforcing culture of participation in which students learn from and support each other.

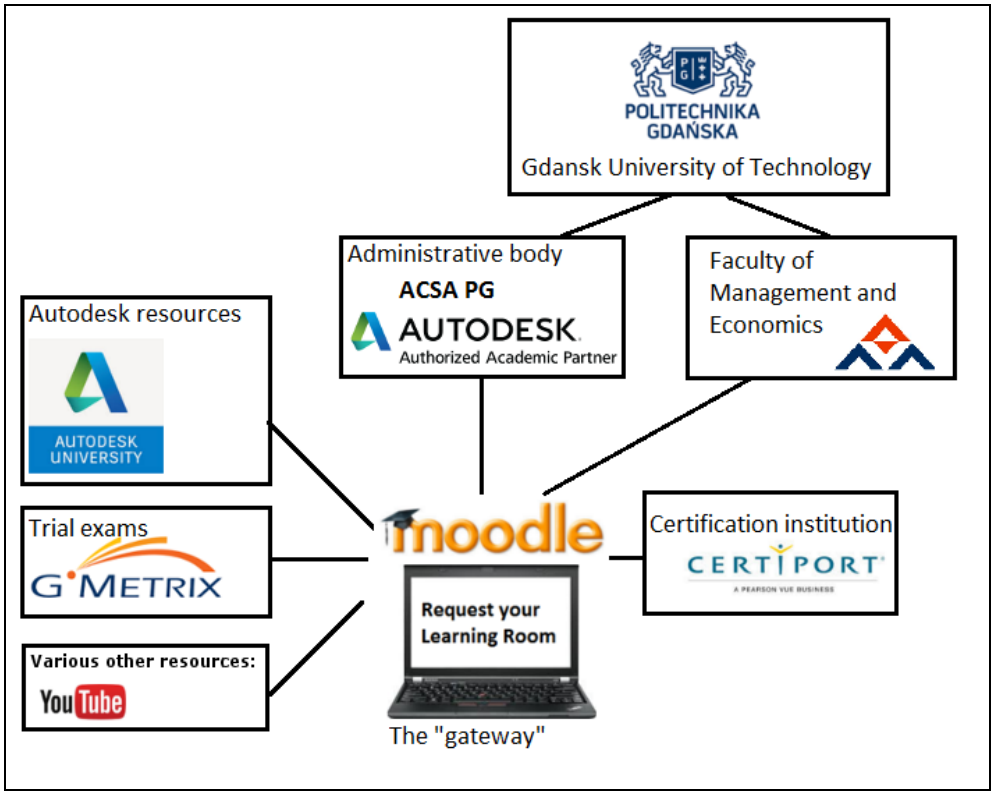

Figure 1. A proposed model

Source: Own work

Registered users will be granted admission to GMETRIX system. This way they will have the opportunity to take a few mock exams before the proper one. Through their Learning Room participants will also get access to Certiport system where their knowledge will be tested and certificates issued. Additionally after each exam participants will be asked to fill up a survey questionnaire. That way the model will get a chance to improve.

CONCLUSION

Since November 2017, ACSA PG has been working at implementing Certiport certification. Because gaining a certificate is a big challenge ACSA PG will propose GMetrix software in order to gain more practice before taking the Certiport exam. GMetrix provides educational tools designed to prepare individuals for the effective use of technology in the business environment. It is planned to involve five instructors in the evaluation of GMetrix tool as a support for those who plan taking part in Certiport exams.

In July 2018 Autodesk announced the publication of a complete Fusion 360 online training course, geared towards Fusion 360 ACU exams (Certiport). It is available free of charge to the Autodesk Learning Partner network. This course can be integrated with Autodesk Authorised Academic Partners' own content. It consists of 27 videos and a total of 160 minutes of content. The next step will be incorporating Autodesk University Open Educational Resources by ACSA PG instructors (Gdansk University of Technology teachers) in their own e-learning courses or MOOCs in order to support their professional development (Smyrnova-Trybulska et al., 2016). Dedicated Learning Rooms and MOOCs will be located in MoodleCloud. Such a solution should help Gdansk University graduates to succeed in a competitive job market.

Acknowledgements

I would like to express my very great appreciation towards the "Strategic Partnership for Creativity and Entrepreneurship (acronym SP4CE)" project for developing Learning Rooms concept. I would also like to thank ACSA PG staff for their assistance with the collection of the data. Last but not least, I also would like to acknowledge the help provided by Anna Grabowska PhD regarding a model implemented at Gdansk University of Technology.

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