
A MODEL OF ONLINE COLLABORATIVE PROJECT-BASED LEARNING (OCPBL WITHIN A DIGITAL COMPETENCE COURSE IN HIGHER EDUCATION

Montse Guitert, Teresa Romeu, Marc Romero, Universitat Oberta de Catalunya, Spain

Introduction

Digital technologies are essential drivers of innovation, growth and job creation in a global economy (European Commission, 2014), there is a Gap between the social need to be updated in the use of these technologies and the training citizens receive to use them in a critical, collaborative and creative way. In that sense, digital competence is becoming a must for employability and active citizenship.

In order to develop a common understanding of what skills englobe the digital competence and to bridge the worlds of education and labour market, digital competence has been defined as: “the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socializing, consuming, and empowerment” (Ferrari, 2012)

Bearing in mind the importance of the digital competence for citizenship and in the HE scenario, the research presented in this paper attempts to respond, based on a methodological proposal, to the problem of the acquisition of this Competence by university students. This proposal, explained in this work, is based on the combination of the Project Based Learning and Online Collaborative Learning in an online UOC's course. The study uses a design based research methodology (Anderson & Shattuck, 2012; Reeves, 2006) in which the course (as an intervention) is designed in conjunction with academics and tutors and then delivered in a natural context. The results are then tested and the course design altered in response to student and teacher results and suggestions.

This work concludes with a set of design principles for effective training in Digital Competence.

Conceptual design and literature review

The conceptual design of this work focuses on online collaborative learning and Project-based learning.

As part of the network society, collaboration has taken another twist, considering that it has to fit in with the networked structure in which the Internet is based (Suárez, 2009). Even collaboration is seen as a key feature of online learning (Garrison, 2006; Kirschner, 2002). In that sense, Dillenbourg (2002) points out that computer-mediated collaborative learning (CMCL) has gained currency in recent years to the point that some state it has become the dominant use of technology in education.

Project-based learning is an instructional method centred on the learner. It allows the investigation of a topic worth learning more about (Harris & Katz, 2001). In fact, a project is defined as a “complex effort that necessitates an analysis of the target and that must be planned and managed, because of desired changes that are to be carried out in people’s surroundings, organization, knowledge, and attitude to life; it involves a new, not previously solved task or problem.” (de Graaf & Kolmos, 2007; p.4)

Starting the implementation of this methodology is not easy for students, but when they advance elaborating their projects, students feel more motivated as time elapses. This occurs because students feel freer to experiment, research and learn for themselves, thus making this method a good learning methodology for the Higher Education context.

Research methodology

This research is based on a critical paradigm (Carr & Kemmis, 1994) in which a transformation of the reality is contemplated and which considers participants as agents of change. Concretely, as can be seen in the following sections, the research was developed through the Design Based Research method (DBR) (Anderson & Shattuck, 2012).

In the early nineties, the Internet made it possible for distance learners to interact with each other. In 1995, the Open University of Catalonia (UOC) was developed as an innovative, online education university focused on lifelong learning.

In this context, the Digital Literacy Area was created considering the digital divide among citizens, as an initiative that helped them to have access to an emerging online education provision and to take advantage of studying online, thereby ensuring digital inclusion and equity.

Within this area, a course for the acquisition of Digital Competence was created to facilitate work and study habits through e-learning to promote the optimal use of technological resources and online learning tools among learners.

The online course evolved from its very beginning from the simple use of the mouse, to acquiring basic digital skills, and then to more complex abilities. The course is taken by an average of 3,500 students per year.

The main aim of the course is to prepare students in a gradual and integrated way for the acquisition of the transversal competence at the UOC: “Use and application of ICT in an

academic and professional environment”. This competence involves: Searching and selection of information online, Processing and development of digital information, Presentation and dissemination of digital information, Digital technology, Study and work planning in a virtual environment, Communication strategies in the Net, Teamwork in an online environment, Digital attitude.

The students are distributed in small teams (4 members) and develop digital projects. To help students with this objective, a set of innovative resources in different formats were created. ICTC is based on a continuous assessment model.

The design of ICTC has evolved over the years through the application of a DBR research process that calls for iterations in which results of student evaluation and learning outcomes as well as changes in the technology, are used to continuously improve the learning design

The major question in this study is which teaching and learning methodology assures students’ acquisition of ICT skills in an online scenario? Specifically, the following sub questions are addressed

- What are student perceptions regarding their own acquisition of the course’s competencies?
- Does the course’s Collaborative Digital Project methodology help the students to acquire ICT competencies?
- Is the assessment model useful for the students’ learning process?
- Are students satisfied with the online teacher’s role during the course?

To answer these questions, a process of selection and design was initiated and developed during the first phases of the research.

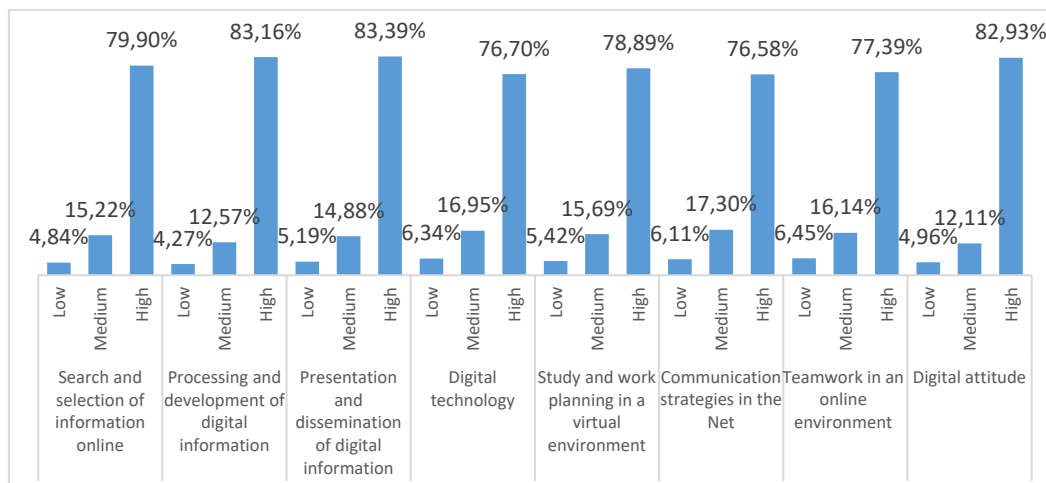
Results and discussion

The quality and relevance of the course is demonstrated by the degree of students’ academic success. According to the institutional statistics, 78% of the students passed the course during the academic year analysed which is higher than the normal pass rate for UOC first year courses. These results are coherent with students’ perception of their acquisition of digital competencies gathered in the course’s questionnaire.

Self-perceptions of the students’ acquisition of the course’s competencies were coalesced from a 1 to 10 scale into low, medium and high ranges: from 1 to 3 being low, from 4 to 7 being medium and from 8 to 10 being high.

A model of Online Collaborative Project-Based Learning (OCPBL) within a Digital Competence Course in Higher Education

Montse Guitert et al.



Graph 1. Acquisition of digital competencies in the course. Course 2014-15

The institutional survey reveals that students' satisfaction with the course increased during the last several years (79%) and considered the course helped them to study online, given that the activities are oriented to provide skills to students that are useful for studying and working online, including those of searching, elaborating and presenting information and organizing their time and the information they generate. Hence, they are satisfied with their degree of transference of the skills learned to their professional field as they state in the open text questions of the course's questionnaire:

"I had no knowledge of group work using the Internet. It has been very useful for me. I think it will be a very useful tool in the future for professional needs."
(Student 1)

The course's methodology

As previously introduced, project-based learning (Railsback, 2002) is the methodological approach utilized; concretely, the developing of a collaborative digital project. To develop the project, students form groups of four, having their own group space which integrates different tools, including the wiki, which stands out as the tool that links all the processes for the creation of the project. The development of the project is planned in four phases (Starting, Structuring, Development, Closing and Dissemination), each of which lay out a set of interrelated activities (Figure 1).

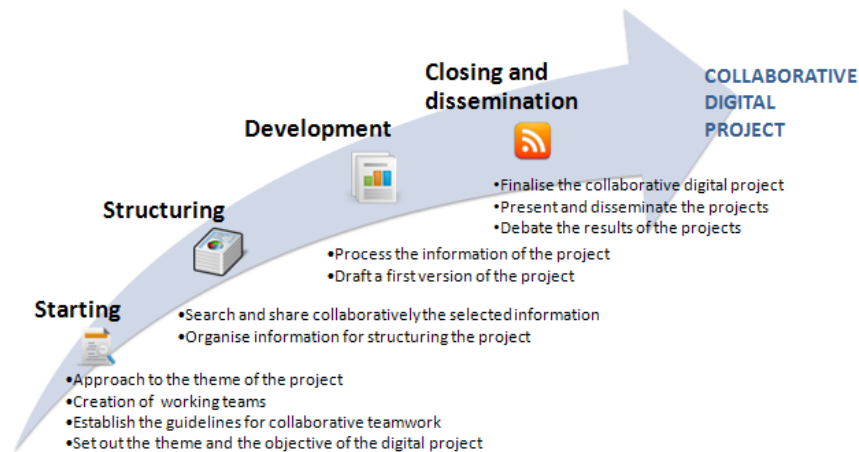


Figure 1. Methodological proposal for a Collaborative Digital Project (Pérez-Mateo et al., 2014)

The starting phase provides an environment to create working teams and perform the initial searches. It is important to give students resources to suitably form the online groups. The collaborative digital project methodology requires the creation of teams. The searches developed during this phase are shared with all classmates through social bookmarking tools.

The second phase involves making a deeper search for information to structure the project. During this phase, students must collaboratively plan the development of the projects and distribute the different tasks among the group members. It involves starting to work together and coordinating different forms of working to share searches focused on the theme of their projects and define its structure for the next phase.

Subsequently, the project is developed: During this phase, groups enter the implementation phase: once each group's dynamics are defined, they draw up the content of the project collaboratively. In order to assess and assure the optimal condition of each group's dynamics, students complete a self and peer assessment process during this phase, which will be explained in the results section.

And finally, discussing the final version of the project. In this phase, students present the final versions of their projects and conclude the collaborative process in the groups with a reflection about the collaborative process developed during the course. In addition, they disseminate their projects in the general classroom space and discuss them in mixed groups created by the teacher.

Most of the students are satisfied with the course's methodology. They consider it has helped them with the acquisition of competencies, represented by some student statements at the open text part of the course's questionnaire:

"The course activities are regarded as significant knowledge and it will be useful to apply it in future activities in the professional field" (Student 2).

The course assessment

The evaluation of the course is based on continuous assessment (group and individual), thereby assuring the progressive acquisition of competencies in each phase. The final assessment is individual given the fact that every student receives a mark at the end of each phase of the project.

Students are satisfied with the assessment model, with an 85% approval, according to the institutional survey.

The continuous assessment of the course is based on the active role of the student and the guidance and monitoring of all the process by the online teacher. Given the fact that different objectives, actors' tools and scenarios intervene in the assessment of the course, we deem it to be a 360° e-assessment. The aim of this 360° e-assessment is to reinforce and boost the students' learning process to allow them to acquire the course's competencies (Guitert et al., 2015). This model is an adaptation of the model proposed by Llorens (2014) which is based on the assessment of human resources.

The 360° e-assessment model promotes a deep, progressive and collaborative learning process, in which both online teachers and students participate (individually and collaboratively). Individual and group processes and group results are all assessed in both the group space and the online classroom as can be seen in Figure 2.

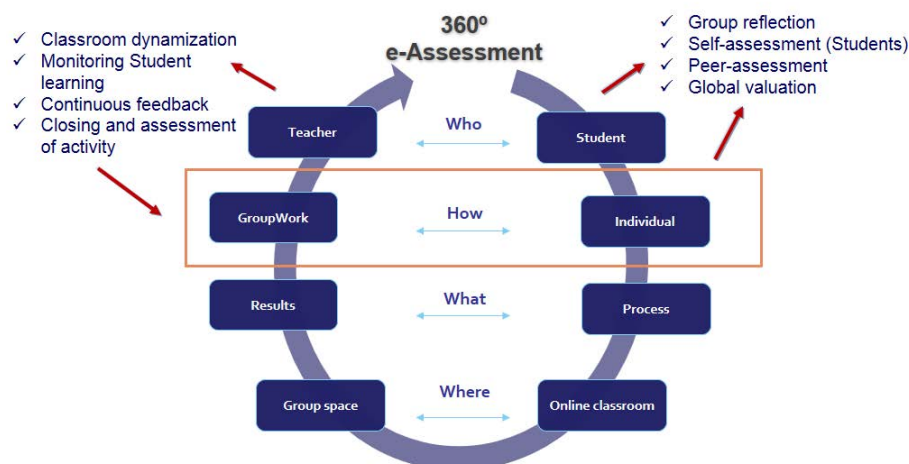


Figure 2. 360° e-assessment of the course

In the course, both the process and the final outcome of the online learning activities are assessed and evaluation is not only performed by the teacher; students also assess their own and their partners' work.

The teacher develops assessment criteria (that are based on the course's competencies) that were public to all during the course; in fact, the assessment criteria are present in the learning activities themselves.

Regarding individual feedback, the students value how it helps them to acquire the competencies and, as some students stated in the open text questions of the course's questionnaire:

"it helps me to understand what I did right and what I did wrong" (Student 12)

"the feedback that the teacher provides makes me improve my activity within the group" (Student 8).

Most students rate very positively the usefulness of self and peer-assessment activities. Students seem to find self-assessment as a good exercise of reflection in order to understand their own learning process and how they acquire the competencies of the course. Regarding the last one, even though some have stated some reticence, they admit its benefits:

"At first, I didn't want to rate my peers' activity in the group, but it helped us to improve our participation in the group and in the end, it was no problem" (Student 13).

The online teachers

Students are very satisfied with online teachers as they stated in both the institutional and course's surveys, which reflects all the work done with them: 88% are satisfied with the teacher's role during the course as they stated in some of the open text questions of the course's questionnaire:

"He has been very important for my success in the course, and without his guidelines I would not have made it!" (Student 10)

This online collaboration among teaching staff promotes the role of online teachers during the development of the activities of the course: they orientate and facilitate the student learning process through their constant teaching presence in both group and classroom spaces. This teaching presence promotes, according to Guitert et al. (2015) a proactive role, hence providing encouragement.

The role of online teachers has been raised over the years, through training in the first stages of their teaching practice, and to assure quality, this first type of training has been conceived as a selection process as well: Online teachers are pre-selected and are trained through an intensive one-month online training period and, depending on how they develop and show their skills during this training, they are finally selected to be a part of the team of teachers.

Conclusions

Answering the major research question of this study, in relation to the methodology presented in this article, students clearly perceive that their knowledge of and competence using digital learning has improved. The research presented in this paper has been developed over the last 20 years, provoking the creation of a methodological model based on the combination of

A model of Online Collaborative Project-Based Learning (OCPBL) within a Digital Competence Course in Higher Education

Montse Guitert et al.

project-based learning and collaborative learning methods, culminating in the Online Collaborative Project Based Learning (OCPBL) model.

The transition from the collaborative digital project (developed in the course) to the OCPBL is explained in the fact that it is an online methodological model that is transferable to other contexts. Answering the specific questions of our research and to promote transference to other contexts, it is necessary to consider the subsequent design principles:

- The course design is a model for the acquisition of digital competence that goes beyond the method (phases of the project); it includes a set of resources, the role of the online teacher and it is closely linked to a continuous assessment process.
- The key elements of this model are the phases of the project, the proposal of a set of activities based on tasks or challenges and its union with collaborative work. In addition, it is a model that requires a high grade of collaboration during almost all the process. The teams formed go through phases that are very much linked to the phases of the project.
- Assessment must be continuous as this methodological model is not possible with a unique and summative assessment; it must be linked to the group's dynamics during its application and must consider individual assessment, facilitating the students' active role as explained in the 360° e-assessment model.
- The proactive role of the online teacher is essential for the application of this methodology, not only during the design of the activities, but also in the continuous monitoring of the process of the groups and their assessment.

The OCPBL model can be represented by the following figure.

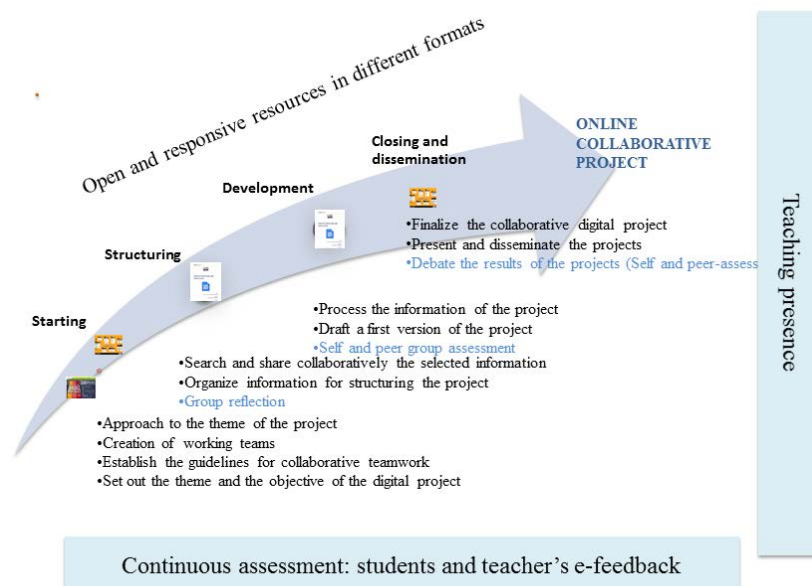


Figure 3. the OCPBL model

Further research could be oriented to analyse if this model can be applied for the acquisition of other competencies besides that of Digital Competence.

References

1. Anderson, T., & Shattuck, J. (2012). Design-Based Research: A Decade of Progress in Education Research? *Educational Researcher*, 41(1), 16–25.
2. Carr, W., & Kemmis, S. (1994). *Becoming Critical: Education, Knowledge and Action Research*. New York: Routledge.
3. Dillenbourg, P. (2002). Over-scripting CSCL: The risks of blending collaborative learning with instructional design. In P. A. Kirschner (Ed.), *Three worlds of CSCL. Can we support CSCL?* (pp.61-91). Heerlen: Open Universiteit Nederland.
4. European Commission (2014). *A common European Digital Competence Framework for Citizens*. Brussels.
5. Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks*. Seville.
6. Garrison, D. R. (2006). Online collaboration principles. *Journal of Asynchronous Learning Networks*, 10(1), 25–34.
7. de Graaf, E., & Kolmos, A. (2007). History of Problem-Based and Project-Based Learning. In E. de Graaf, & A. Kolmos (Eds.), *Management of Change Implementation of Problem-Based and Project-Based Learning in Engineering* (pp. 1–8). Rotterdam: Sense Publishers.
8. Guitert, M., Romeu, T. & Romero, M. (2015). *360° e-Assessment: An Online Collaborative Process in the Scenario of the Open University of Catalonia (UOC)*. Paper presented at the EDEN Annual Conference, June 9-12, Barcelona, Spain.
9. Harris, J. H., & Katz, L. G. (2001). *Young Investigators: The Project Approach in the Early Years*. NY.
10. Kirschner, P. A. (2002). *Three worlds of CSCL. Can we support CSCL*. Heerlen: OU of the Netherlands.
11. Llorens, F. (2014). *Identificación y evaluación de la función docente de consultoría en la Universitat Oberta de Catalunya: el caso del “Máster Universitario en Educacion y TIC (e-learning)”*. TDX (Tesis Doctorals en Xarxa). Universitat Oberta de Catalunya.
12. Pérez-Mateo, M., Romero, M., & Romeu, T. (2014). La construcción colaborativa de proyectos como metodología para adquirir competencias digitales. *Comunicar*, 42(XXI), 15–24.
13. Railsback, J. (2002). *Project-based Instruction: Creating Excitement for Learning*. Portland: Northwest Regional Educational Laboratory. Retrieved from http://educationnorthwest.org/webfm_send/460
14. Reeves, T. (2006). Design research from a technology perspective. In J. Akker, K. Gravemeijer, S. McKenney, & N. Nieveen (Eds.), *Educational design research* (pp. 52–66). New York: Routledge.