

MOOC DESIGN AND HERITAGE EDUCATION. DEVELOPING SOFT AND WORK-BASED SKILLS IN HIGHER EDUCATION STUDENTS

Antonella Poce
Francesco Agrusti
Maria Rosaria Re

Roma Tre University
antonella.poce@uniroma3.it, francesco.agrusti@uniroma3.it,
mariarosaria.re@uniroma3.it

Keywords: High Education; MOOC; Distance Education; Museum education; Education Experiences

The present paper describes one of the pilot activities foreseen by the Erasmus+ project DICHE (Digital Innovation in Cultural and Heritage Education in the light of 21st century learning). The above mentioned pilot activity was carried out at the undergraduate course in Educational sciences – University Roma TRE, as an internal training module for the conception, implementation and evaluation of MOOC courses in museum education. Main objective of the module was to develop design and realisation skills in Educational science students. Those engaged in the module were asked to create cultural and heritage education courses for primary school in training and in service teachers. The two main pillars of the DICHE pilot, “MOOCs conception and delivery” and “heritage education”, are in line with the

for citations:

Poce A., Agrusti F., Re M.R. (2017), *MOOC Design and Heritage Education. Developing Soft and Work-based Skills in Higher Education Students*, Journal of e-Learning and Knowledge Society, v.13, n.3, 97-107. ISSN: 1826-6223, e-ISSN:1971-8829
DOI: 10.20368/1971-8829/1385

most recent national and international field literature research and with the Italian education system directions, aiming at integrating museum education in primary school curricula and a more aware use of technology, in order to develop pivotal skills in active citizenship building. The present paper presents the methodology adopted and the results collected during the training module carried out.

1 Introduction

For several years, the Laboratory for Experimental Research at the Department of Education of University Roma Tre has been developing a research line aimed at promoting a critical use of technology, which could help the twofold objective of interpreting technology as a tool and of increasing critical thinking skills (Poce *et al.*, 2012). Employing structured and tested models in several interdisciplinary applications of a specific starting research hypothesis, the students were involved in different activities of analysis and reflection, individually and in groups, at different levels: from the presentation of cultural contents, through the medieval *lectio magistralis* scheme, to the delivery and evaluation of free online learning materials (e.g. MOOCs). The general goal of such research projects was to provide students with a long-term structural and instrumental basis, adaptable to different contexts and overcoming “the emphasis in supporting educational potentials of instrumental proposals, too often based on analogies and short-term suggestions” (Vertecchi, 2012).

On such background basis, LPS and its Centre for Museum Studies (CDM) branch have taken part in the Erasmus+ project DICHE (Digital Innovation in Cultural and Heritage Education in the light of 21st century learning), which was funded in September 2015. The project, 30 months long, involves six partners from four European countries (Netherlands, Belgium, Great Britain and Italy): Marnix Academie, Stichting Landschap Erfgoed Utrecht, ATIT, Loughborough University, Coopculture, LPS - Laboratory for Educational Research and CDM - Centre for Museum Studies - University of Roma Tre. The main purpose of the DICHE project is to integrate the use of digital resources in the primary school learning processes, especially concerning artistic and cultural heritage education. This aim is in line with the European Union directions, regarding the need of integrating today’s learning systems with new methods and new technological equipment, in view of the development of active citizenship skills. The development of pupils’ skills recalls the Recommendation 2006/962/EC of the European Parliament and Council dated 18th of December 2006, on key competences for lifelong learning [Official Journal L 394, 30.12.2006, p. 10]. In particular, the DICHE project intends to develop the so-called “4Cs” ability scheme (*Critical thinking, Creativity, Communication and Collaboration*), already defined by Trilling and Fadel (2009) as fundamental educational skills

for the development of more complex skills.

2 State of the art

Over the last few years, an extraordinary development of MOOC courses has taken place, mainly at University level, both nationally and internationally. The great diffusion of such free courses raised, after the first experiences, a series of critics (Daniel, 2012; Dillahunt *et al.*, 2014, Hollands & Tirthali, 2014; Rohs & Ganz, 2015, Schuwer *er al.*, 2015). Those were mainly due to the following issues: drop out rates, in some cases extremely high, low participation from the Third Countries, lack of pedagogic and didactic strictness in the design of the MOOCs, together with the lack of quality criteria (Stracke, 2014).

Despite all of the above, the spread of the MOOC phenomenon demands attention by all those engaged in education who, through the conception and design of such courses, have the chance to improve their teaching competences as well as their cross sectional digital, analytical and critical thinking skills.

Moreover, the application of digital resources in the field of artistic and cultural heritage education is a real challenge for innovation: museum education has the opportunity to be integrated with technology and, at the same time, develop new teaching methods for the benefit of all but especially for young users. In 2013, the MoMA, in New York, produced a MOOC addressed to museum operators and educators. Over the first 4 weeks, it was able to reach 17,000 users from all over the world (Mazzola, 2013). In 2015, the University of Leicester promoted a MOOC entitled “Behind the scenes at the 21st Century Museum”, first example of accessible online course, created with the support of Liverpool National Museum. The project underlined the importance of shared management between museums and Universities in the planning and realisation of courses such as MOOCs. Such methodology significantly improved the quality of the proposed contents and, in a broader sense, also museum and academic didactics (Parry *et al.*, 2016).

Starting from the above-mentioned remarks, the LPS/CDM research group designed and realized a training module for Educational Sciences students, with the aim of making students develop their teaching skills in the field of cultural and heritage MOOCs implementation. The Italian school system, moreover, promotes the experimentation of new models, the use of innovative tools and the dissemination of best practices through the National Digital School Plan (issued in 2008 and transformed in one of the pillars of the 107/2015 act, aiming at creating new learning environments). Besides endowing schools with technological tools, it is mandatory to train prospective teachers and educators in the use of innovation and didactics design and in the use of integrated digital contents (CDI – L. 221/2012), Learning Objects, LIM and OERs.

Providing students with the necessary tools in order to design a sound structured MOOC, and to peer evaluate the proposed online course, constitutes a basis for the promotion of learning to learn and learning by doing activities, but it is also a way to increase their analysis and critical thinking skills development. The main objective was to let students independently build learning courses based on innovative museum education issues and evaluate the quality of online digital resources addressed to any external users but especially for future educators.

2.1 Methodology

The students' objectives within the internship module "MOOC, critical technology and museum education" were the following:

- to take part in critical online discussion groups on specific topics;
- to investigate issues of their interest, guided by an online tutor;
- to develop and create MOOCs in the field of museum education;
- to develop and implement specific evaluation tools for distance learning;
- to learn how to use a virtual learning environment (VLE) for distance learning;
- to learn how to use collaborative writing tools to draft a group project;
- to become familiar with MOOCs and their potential;

The module had the macro-objective of providing students with the necessary tools for the design, implementation and evaluation of prototypal MOOCs in contexts of museum didactics. The courses had to be designed by the students on the basis of the national guidelines for primary education (DM 254/2012). They also had to be described in a booklet, outlining the educational course and its detailed structure, and be introduced by a video, appropriately included in the course plan.

The activities foreseen by the internship module "MOOC, critical technology and museum education" involved 42 students from the course in Educational Sciences and were carried out in groups of 5-6 students; peer assessment of the MOOC products was individually carried out by each student. All the activities foreseen within the internship have been outlined on the basis of "peer learning" methodology (Topping, 2005), with the precise aim to create a positive interdependence within each group and among all the groups involved. This, consequently, allowed the increase of knowledge quality and skills' levels ultimately acquired by the students.

Three compulsory face-to-face meetings and a number of distance activities on the *Orbis dictus* virtual learning environment (www.orbisdictus.it) were organized within the course, according to the schedule described below:

- Presentation of the project's objectives and description of the VLE course. Presentation of the MOOCs phenomenon, introduction to MOOC design and its use within the course. Students were divided into groups of 5/6 persons.
- First online activity: critical discussion and draft of the MOOC design. On the basis of both the available material and the task, students were asked to carry out online researches and discussions on the presented topic and summarise them in the virtual space at the group's disposal. The discussion about the project took place in a dedicated group forum within the VLE. The writing phase of the project took place in collaborative form on a shared writing paper.
- Second online activity: realization of the MOOC and of the connected teaching tools. In particular, the groups were asked to realize at least one video, as planned into the educational path created during the first activity. Discussions about activities were carried out on the dedicated forum. Besides moderating discussions, tutors provided brief summaries of the work in progress.
- Intermediate face-to-face meeting. The various groups met in person, and presented the implemented MOOC prototypes to other course students. During the meeting, all the videos created by the groups were shown. At the end of the presentations, the assessment grid for evaluating MOOC prototypes were introduced by the tutors.
- Third online activity: assessment activities on the implemented MOOCs. Each student was asked to individually assess, using the VLE tools, the MOOCs realized by fellow students during the course. The activity was completely carried out online, on the Orbis dictus platform.
- Final meeting: the results of the MOOCs' peer assessment conducted by the students were presented to them by the tutors. At the end of the last meeting, students also filled in a short evaluation questionnaire on the entire experience.

Peer assessment results of the MOOCs created by the students during the module are provided in the next paragraph and represent the core section of the present contribution.

2.2 Results

Peer assessment was the last activity for the students taking part in the course. While in the other activities students were asked to cooperate, this assignment was designed for them to work individually and evaluate the MOOC paths developed by their colleagues. In particular, with the help of an

ad hoc created assessment grid, every student was asked to evaluate the didactic videos and learning paths created by the other groups. The rationale behind this activity is that the students develop metacognitive reflections on the learning process they outlined as well as on the multimedia materials produced. The next step is to build a critical evaluation of peers' productions.

The assessment grid provided to the students to help them carry out the peer assessment activity is structured in the form of a questionnaire organized in the following 4 sections: Video and contents quality (Likert Scale); Module skills evaluation (Likert Scale); MOOC assessment (Multiple Choice); Strengths and weaknesses (Open Ended). The results of the evaluation are provided below.

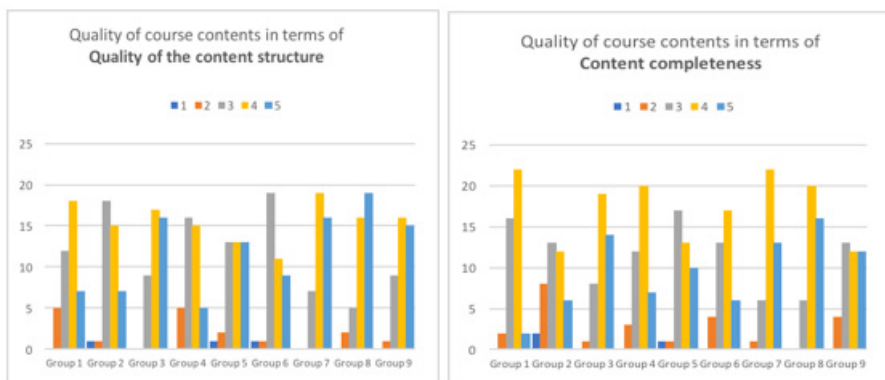


Fig. 1 - Video and contents quality evaluation.

Most of the MOOCs designed within the course were positively evaluated. In particular, the MOOCs' clarity of structure and teaching unit design was positively assessed in all cases. Groups 3, 7, 8 and 9 were given the highest marks. This indicator proves to be especially relevant taking into consideration the main objective of the module the students were engaged in. Abilities involved in reflecting and arguing on project and draft of a teaching unit, even if written by others, together with tools analysis, are pivotal to be acquired as prospective educators. As far as content completeness is concerned, results rank in the medium high slot of available marks. On average, the MOOCs' learning paths outlined by the students appear to be consistent with the identified target group and clear, as far as structure and contents are concerned. The technological and non-technological tools developed during the course, such as the assessment tools, are generally introduced in a fairly consistent and clear way. Clarity of vocabulary, essential indicator in a teaching and learning activity, was given a medium high-level score for every course and video produced.

According to the module skills evaluation, the competences that were more frequently given the highest marks (level 5 and 4) are *Collaboration* and *Creativity*: these skills have been introduced in every MOOC designed by the students. The reason for such a choice is probably based on the peculiarity of such competences: teaching and learning methodologies based on cooperation and the creation of new products are fundamental in every primary school curriculum. *Creativity*, as above stated, is the competence able to get children closer to the world of art, thanks to its richness of emotions and experiences. It is not surprising, therefore, that students of Educational Sciences stress such aspect in the teaching and learning paths conceived in the module.



Fig. 2 - Skills evaluation.

Critical thinking, the most complex skill to be inserted in a primary school path, has been taken into account by a significant number of groups: group 3 ranked best with a multi-disciplinary MOOC on water saving, which ranges from ecology, to geography, to history, to science and art education, developing a course on Roman aqueducts.

Such multi-disciplinary approach allowed an innovative development of the topic. The merging of ideas from various scientific subjects, regarding contents and methodologies, overcomes knowledge localisation (Morin, 2000) facilitating the reasoning of the pupils in terms of complexity and globalisation. It also helps children to consider knowledge in a critical and united way. On average, the Communication indicator was given medium/high scores. Marks are 40%. higher than other evaluation results.

In the general evaluation phase, both MOOCs' paths and videos were taken into consideration. The results of the assessment survey are summarised in the following graph.

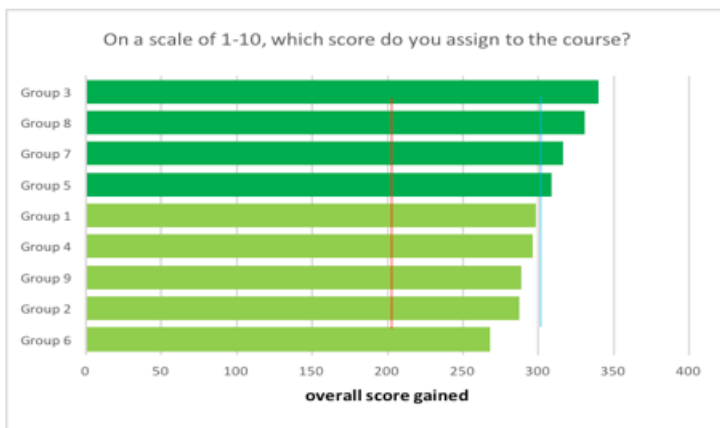


Fig. 3 - Students' evaluation.

The best scores are shown in the medium–top slot. They rank above the average value of 303 (group 3: 340 points; group 8: 331 points; group 7: 316 points; group 5: 309 points) out of 400 points available. Overall, every group was awarded more than the minimum pass score (210 points). The average score is given by every student giving the average of 5 in the individual evaluation, that is 42 times). Such result mirrors the good average level of teaching and learning paths developed according to the guidelines. Support and feedback by online tutors, especially as far as group activities are concerned, proved to be crucial for the successful completion of the activities.

The last questions of the peer assessment questionnaire were open. Students were asked to summarize the strengths and the weaknesses of each MOOC under scrutiny. Every open-answer feedback provided by the students was collected to create a unique corpus. A content analysis was carried out, in order to understand which terms appeared most frequently.



Fig. 4 - Tag cloud representation.

3 Discussion

As shown by the synthetic representation of the content analysis performed (Figure 4), the core elements that were identified, reflecting the strengths and weaknesses of the courses, are the following: the MOOC video, the structure and the design of the educational path (“struttura”, “corso”), the role of the museum object (“oggetto museale”) in the learning path, the enhancement and development of certain skills (“creatività”, “competenze”). Regarding such items, students also made suggestions on improvements of the planned courses; such improvements mainly focus on the educational units’ duration (in the above tag cloud: “durata”, “lezione”, “corso”), on the activities carried out and on the teaching and learning methodologies employed. Clearness, creativity and originality are considered as strengths in the educational paths proposed: the use of a particular kind of museum object has been appreciated by all students as a way to develop specific knowledge.

The structure of the MOOC videos is one of the main weaknesses identified during the peer assessment activity: videos were conceived by some groups as a presentation of the learning path and not as its integral part as they were meant to be. As for the pupils’ activities, group 1 has been commented by other students due to a use of museum objects based on gender connotation (jewellery for girls and swords for boys): this is why the word “femmine” (“girls”) is so evident in the tag cloud shown above. Moreover, assessment activities (“valutazione”) are seen as a “weakness” for some groups: not all groups planned clear assessment modalities (e. g. formative and summative assessment sessions) and inserted a predetermined assessment grid in the structure of their MOOC courses.

Conclusions

The proposed system of educational-training experience within the DICHE project proved to be innovative in the field of distance learning in general and in university education in particular. The promotion of the MOOC phenomenon is rapidly developing on a large scale, demonstrating the educational potential of a teaching technique which, apparently, has no limits. The connection between the MOOCs and the promotion of artistic and cultural heritage is fairly new in the field of museum education. The skills to be developed by students who want to get a degree in Educational Sciences are fully related to their educational and general training (planning, implementation and evaluation of educational courses) and will also contribute to the development of soft skills (e-skills, critical thinking, research skills) necessary for their future access to labour market as educators and teachers. Participation in European and international

projects also allows students to put in practice the knowledge acquired through their involvement in courses and allows them to compare the acquired skills with the latest international research standards.

Peer learning, in particular, allowed the further development of acquired knowledge and abilities. The peer assessment activities, in particular, helped as a critical and metacognitive reflective session on the learning paths outlined by the students themselves.

The above-listed results can be useful to plan differently the training of future educational staff at different levels of instruction. In the near future, those students will have to prove to be able to show a series of competences that the educational scientific and academic community, the European Union and the global system strongly demand today. The ability to develop a project, carry out an analysis, show critical evaluation abilities and prove to be able to use ICT in a reflective way are essential to train active citizens and, at the same time, educators able to stimulate such competences in the pupils attending their classes.

Acknowledgments

A. Poce coordinated the research presented in this paper. Research group is composed by the authors of the contribution that was edited in the following order: A. Poce (Introduction, State of the Art, Discussion, Conclusions), F. Agrusti (Results), M.R. Re (Methodology).

REFERENCES

- Daniel J. (2012), *Making sense of MOOCs: musings in a maze of myth, paradox and possibility*, Journal of interactive media in education, 18(3).
- Dillahunt T., Wang Z., Teasley S.D. (2014), *Democratizing higher education: exploring MOOC use among those who cannot afford a formal education*, International review of research in open and distributed learning (irrodL), 15(5).
- Hollands F.M., Tirthali D. (2014), *MOOCs: expectations and reality, full report*, Center for benefit-cost studies of education, Teachers College, Columbia University.
- Kraybill A. (2015), *Going the distance: online learning and the museum*. Journal of museum education, 40(2), 97-101.
- Mazzola L. (2013), *MOOCs and museums: not such strange bedfellows after all*. [Http://mo.ma/2ddfddzd](http://mo.ma/2ddfddzd).
- Morin E. (2000), *La tête bien faite*. Repenser la réforme, réformer la pensée, Paris, Seuil.
- Parry R., Moseley A., Gretton N., Tunstall R., Mobbs M. (2016), *Why MOOCs matter: the consequence of massive open online courses for museums, universities, and*

- their publics*. Museums and the Web 2016, 1.
- Poce, A. (2012) (ed), *Contribution to the definition of a critical technology*. An assessment study, Milano, FrancoAngeli.
- Richter. T., Adelsberger H.H., Khatami P. (2016), *MOOCs in POM education*, Proceedings of the 27th POMs conference, Orlando, USA.
- Rohs M., Ganz M. (2015), *MOOCs and the claim of education for all: a disillusion by empirical Data*, International review of research in open and distributed learning, 16(6).
- Schuwert R., Gil-Jaurena I., Aydin C.H., Costello E., Dalsgaard C., Brown M., Jansen D., Teixeira A. (2015), *Opportunities and threats of the MOOC movement for higher education: the European perspective*. International review of research in open and distributed learning, 16(6).
- Stracke C. M. (2014), *The concept of open learning for opening up education*. In Stracke, C. M. et al., *Changing the trajectory. Quality for opening up education*, Berlin, Logos Verlag Berlin.
- Trilling B., Fadel C. (2009), *21st century skills: learning for life in our times*, San Francisco, Jossey-Bass.
- Topping K. J. (2005), *Trends in peer learning*, Educational Psychology, 25(6).
- Vertecchi B. (2012), *Prefazione*, in *Contribution to the definition of a Critical Technology*. An Assessment study, Milano, FrancoAngeli.