Training for Digital Creative Teaching: Outcomes of the Spanish DoCENT Scenarios Creation Workshops

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Abstract. For many years teaching creatively has been considered as an important factor for enhancing students' creativity. Nowadays, the potential of digital tools to stimulate and exercise creativity is recognised, but the use of such tools is not sufficiently explored in today's classrooms. It has been acknowledged that educators are not adequately prepared to apply creative teaching strategies using digital tools that are attractive to students. Within the DoCENT project (Erasmus + Programme) a series of training workshops were organised in three European countries (Italy, Greece and Spain) with the ultimate goal of teachers being able to design their own creative scenarios using different digital technologies. This paper presents the experience gathered during a series of seminars organised in Spain, and the results from the point of view of teacher educators in terms of their capacity of designing creative learning activities using robots and digital games.

Keywords: Digital Creativity, Teacher Training, Scenarios Design, Creativity Competences.

1 Introduction

Creativity is lately seen as an essential competence that all individuals should master in order to address the continuous changes which feature the modern society [1, 2]. To this end, educational policies call for the development of creativity in students from all levels. Nevertheless, education systems seem to fail to efficiently integrate creativity [3]. This is due to different factors, such as the lack of teacher training and of concrete methodologies to foster students' creativity.

In the digital society, the concept of creativity is being reconceptualised. Indeed, the affordances of technologies may have a strong influence on creative processes and achievements. As mentioned by Loveless [4], "digital technologies can be tools which afford learners the potential to extend or enhance their abilities, allow users to create novel ways of dealing with tasks which might then change the nature of the activity itself, or provide limitations and structure which influence the nature and boundaries of the activity" (p. 64). Nevertheless, understanding the interplay between digital and creative yet appears as a challenge, and the two are often studied as separate domains [5].

As a first step to bridge this gap, the DoCENT project[1] propose the following definition of digital creativity, as applied to education (based on [6 and 7]): "purposive imaginative activity, mediated by digital technologies, generating outcomes that are original and valuable in relation to the learner". As applied to education, digital creative teaching would consist of applying digital technologies with the aim to support creative pedagogies, i.e. learner-centered approaches, open-ended ethos, synergistic collaboration and knowledge connection. DoCENT has proposed a framework of competences for digital creative teaching [8].

2 Design and Implementation of a Training Model

2.1 Training objectives and curriculum

During the 2018-19 academic year within the DoCENT project a series of open blended courses (including face-to-face and online modules) were planned for teacher educators from 3 EU countries (Spain, Italy and Greece). The overall goal was for the participants to learn and reflect on how to use cutting edge digital pedagogies for enhancing creative competences. We aimed to develop, implement, validate and disseminate an innovative model to guide teacher educators in applying digital creative teaching practices. During the face-to-face part of the training, participants were supported in the creation of their own learning scenarios, based on digital technologies, aiming to enhance students' creativity in their teaching settings. As an example, in Spain the face-to-face training covered the following topics:

- Digital creativity in education (introduction and definition)
- Creative interactions and dynamics in the digital classroom
- DoCENT competence framework for digital creative teaching
- Digital creative pedagogies: approaches and tools for integrating digital creativity in Teacher Education (game-based learning, gamification and serious games, tangibles interface, educational robotics, inquiry-based learning).

2.2 Implementation of the training workshops

In Spain, six workshops were organised with a total of 93 participants – teacher educators and teacher trainers. Two series of workshops were organised:

– Workshops A: focusing on the introduction of digital creative pedagogies and the DoCENT Competence Framework – two workshops in November 2018 with 24 participants, from nine different teacher training institutions (including universities in Barcelona and around, as well as the Educational Department of Catalonia).

[1] DoCENT – Digital Creativity Enhanced in Teacher education - Erasmus +, Strategic Partnerships for Higher Education, 2017-19, project number 2017-1-IT02-KA203-036807

- Workshops B: focusing on the co-design of digital creative scenarios – four workshops in February 2019 with 65 participants from 19 different teacher training institutions, including various universities in Barcelona, Catalonia and worldwide.

Three members from the DoCENT team presented contents, as well as moderated the discussions and hands-on sessions.

In order to stimulate active participation and discussion, we aimed to gather small numbers of participants. Workshops were held in a room equipped with laptops, a video projector, and different digital educational kits. A variety of activities were planned, according to the following scheme:

- Introduction: We proposed to participants to carry out Guilford's uncomplete drawing task [9]. Each of them had two printed uncomplete figures that they were asked to complete in 3 minutes, following their imagination and spontaneity. Participants briefly presented their drawings and introduced themselves to the group.
- Theoretical session: We presented to participants theoretical contents related to the following topics:
  - The DoCENT project: context, objectives, consortium, methodologies and digital tools;
  - What is creativity? The different dimensions of creativity and the main concepts around it;
  - The application of creativity and digital creativity in educational settings;
  - The DoCENT competence framework areas and descriptors;
  - Digital creative pedagogies: game-based learning, manipulative technologies and inquiry-based learning.
  - Creative interactions and dynamics in the digital classroom, the role of teachers and students in the digital creative classroom, and how to promote a creative environment in the digital classroom.
- The DoCENT Serious Game[2]: playing and providing feedback: During a game session, participants had the chance to try out the prototype of the DoCENT game. In order to stimulate "think aloud" processes, they played by pairs. During the session, the DoCENT team observed participants' interactions and took notes. Afterwards, we organized a debriefing session during which participants could provide feedback on the prototype.

[2] DoCENT Serious Game is a role-play simulation developed within the DoCENT Project. It uses autonomous agents as virtual interlocutors (bots). The game is organised around several scenarios (learning settings and situations), each one independent from the others, in which users take the role of a teacher interacting with its students. The interaction aims to provide a realistic experience of the organisation and management of a real classroom related to digital creative competences. The DoCENT Serious Game is designed as a combined approach with the DoCENT MOOC. More information and free download: https://docent-project.eu/outputs/practical-tools

- Presentation of the DoCENT MOOC[3]: Afterwards, we presented the DoCENT MOOC objectives, topics and outlines.
- Hands-on sessions: participants were invited to join one of the two parallel hands-on sessions. Teacher chose the one they were interested in, according to their teaching disciplines and professional interests.
  - Game-based learning: use of Scratch[4] and Minecraft[5] for a course of digital architecture;
  - Educational robotics: use of LEGO Education WeDo[6] for teaching maths in a creative way and use of BeeBot[7] for storytelling.
- Design of digital creative teaching scenarios: Afterwards, we stimulated participants to design a learning scenario to enhance digital creativity in their own educational contexts. To do so, they filled out a template designed especially for the DoCENT scenarios creation that included a checklist of the descriptors from the DoCENT Competence Framework. Participants had to specifying the following aspects:
  - Their educational context and objectives (i.e., discipline taught, students' level, pedagogical objectives);
  - The way in which they would integrate creativity and digital technologies in their teaching practices;
  - The way educational activities would be sequenced in the classroom;
  - The evaluation methodologies used to assess students' knowledge and skills;
  - The digital creative competences which would be developed across the scenario.
- Evaluation and closing: To close the event, we informed participants of the future activities of the project. Data collection took place using DoCENT evaluation forms with focus on evaluating the training.

3 Results

DoCENT training in Spain provided us with twofold results: on one hand, we collected feedback about the DoCENT MOOC and the Serious Game. On the other hand, the

[3] DoCENT MOOC is a free online course developed within the DoCENT project focusing on Digital Creativity in Education. Concrete approaches and tools for integrating digital creativity in Teacher Education are presented in detail, such as the use of tangible interfaces, educational robotics and inquiry-based learning. Strategies for evaluation of digital creativity are also covered. More information and free access: https://docent-project.eu/outputs/practical-tools/mooc-platform

[4] https://scratch.mit.edu/

[5] https://minecraft.net/

[6] https://education.lego.com/en-us/elementary/intro/wedo2

[7] https://www.tts-international.com/bee-bot-programmable-floor-robot/1015268.html

participants initiated the design of digital creative teaching scenarios and had the opportunity to reflect on the DoCENT Competence Framework and its usefulness in the process of scenarios design.

Considering the MOOC and the Serious Game, both were perceived as very useful resources to be used with students enrolled in teacher training programmes (pre-service, master or in-service). In addition, the DoCENT Serious Game was seen to be a good visual resource to support the theoretical training that will appear in the MOOC. It was perceived as especially useful for new teachers before being introduced to the theoretical concepts around creativity, i.e. as a reflection and motivation tool. The hands-on session provoked a discussion between the participants about the necessity to break within the game the gender stereotypes by avoiding characters that are "a typical professor" (for example, teacher to be a character with glasses, dressed in typical teacher clothes and in a classroom environment with standard desk distribution towards a blackboard).

During the scenario design sessions, participants sketched specific activities targeting students' and courses they regularly teach. These included Didactics, Mathematics, History and Geography, Language Learning and even Sports, Food and Health at Bachelor and Master levels. All scenarios were designed as learner-centered and with many group activities. The majority of the proposals included final presentations of the teachers' creations, and often the assessment was planned to be done by peers using the rubrics proposed by DoCENT.

The analysis of the produced scenarios revealed that most activities proposed were considering the use one or more of the methodologies and the tools presented during the training sessions, such as the educational robotics with BeeBot and LEGO Education WeDo, and the creation of games with Scratch. Some scenarios were closely related to the activities presented hands-on sessions (i.e. the new scenarios included the design of the Scratch game or story-telling and words acquisition with BeeBots, as proposed by the DoCENT team, although adapted to the concrete learning setting of the author). The participants commented that they would need further training on other affordances of each tool in order to exploit their full potential. Considering the choice of digital tools, participants rarely chose tools they knew from before (i.e. tools that were not presented in the training), such as tools for 3D design and 3D printing. This fact hints again that lack of awareness in the target group of the digital tools and their possibilities for creative teaching practices.

Participants reflection on the scenario design exercise led to the shared observation that the activities that stimulate creativity might require extended periods of time, which is in some occasions limited in the current educational system (both in higher education for pre-service teachers and in primary/secondary education).

4 Conclusions

Creativity is considered and important skill for todays and the future EU citizens and it is widely agreed that it should be nurtured and stimulated from early school and further in the education. The main actors in this process – the teachers and their trainers, still lack adequate knowledge and preparation to tackle digital creativity. The proposed DoCENT approach in Spain combined face-to-face and online MOOC training enriched with a serious game and scenarios design was perceived as good approach. Other countries chose different tools but the same methodology.

We think that this approach reinforces the digital creative competences of teacher educators in line with the framework proposed by DoCENT. However, more time and the active use of teachers of other digital technologies are needed to consolidate the acquired competencies.

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