The DoCENT role play game: a tool for the training og the digital creativity for teachers

Raffaele Di Fuccio[1], Fabrizio Ferrara[2] and Andrea Di Ferdinando[1]

[1] Smarted srl, Via Riviera di Chiaia 256, 80121 Napoli, Italy
[2] Università di Napoli Federico II, Via Porta di massa 1, 80133 Napoli, Italy
raffaele.difuccio@gmail.com

Abstract. In the framework of the DoCENT project (Digital Creativity ENhanced in Teacher education) co-funded by the Erasmus+ programme of the European Union, the authors developed a serious game, based on role playing game methodology. The paper shows the structure of the game with particular results on the management of feedback for the teachers derived from an adaptive tutoring system. The teacher has the possibility to interact with a classroom in a virtual and safe environment and could train the teaching of digital creativity in a real context. In the paper the authors describe the DoCENT game developed on the pedagogical framework of digital creativity, a set of six different students' competences areas. The game includes different scenarios designed in order to cover all the competence areas and train the teacher on each aspect and that cover different digital creativity activities, namely: 1) coding activities for children (i.e. Scratch), 2) tangible user interfaces applications, 3) STEM application with digital interfaces. the feedbacks.

Keywords: Role playing Game, Tutoring Systems, Digital Creativity, Serious Game, Pedagogical Framework, Students' competences Area

1 Introduction

1.1 The Digital Creativity

The quick increase of innovations, technologies and the advent of digital market boost new jobs and new opportunities for all kind of workers. Also, the traditional jobs benefit from these innovations. In order to gather these opportunities, the workers need a combination of new skill and competences that comprise abilities and learning dispositions in a multidisciplinary and holistic approach. In parallel, workplaces are changing and it represents a challenge for the current workers and the workers of tomorrow. Organizations needs approaches to managing people and production systems in ways that assure the transformation of inputs into quality outputs, in order to meet employees' expectations. A better use of their knowledge and skills leads employees to increase their job satisfaction and commitment (indicators of organizational well-being). Furthermore, organizations are more productive and profitable if they are able to design a workplace that creates congruence between employer and employee interests.

At the same time, the creativity is a valid approach in order to face new challenges, to see out of the box, however the potential of the creativity linked with new tools in the digital era are very promising. This perspective it is the same of the document the Council Recommendation on Key Competences for Lifelong Learning of the European Commission, when describe the Digital Competence states "Individuals should be able to use digital technologies to support their active citizenship and social inclusion, collaboration with others, and creativity towards personal, social or commercial goals"[1] considering a strong overlap with the creativity.

The project DoCENT (Digital Creativity ENhanced in Teacher education) aims to propose a solution oriented to initial teacher education (ITE). The idea is to prepare a new generation of teachers, aiming to enhance digital creativity in ITE contexts. In this view, the definition of the digital creativity [1] of the DoCENT project is the use of digital technologies to develop processes that address to creativity

The project, funded by the European Commission in the Erasmus+ programme that is ongoing, aims to develop, implement, validate and disseminate an innovative model to guide teacher educators in applying digital creative teaching practices.

DoCENT project has its nature in the education field, promoting, disseminating and increase awareness on digital creative teaching. The idea is to apply digital pedagogies to develop processes that are particular to creativity, i.e. promoting learner-centred methodologies, allowing for self-learning, helping to make connections, boosting exploration and discovery, providing a safe environment that encourages risk-taking behaviours and encouraging collaboration. This approach finds its completion in the development of a role-playing game, a serious game, for teachers where they could train their abilities regarding the learning of digital creativity in the classroom.

2 Prototype description

2.1 The Serious Game for the DoCENT Project

The DoCENT Serious Game (DSG)[2] has the structure of a role-playing game that allows teachers to test and train himself/herself in a safe environment in order to learn the best strategies for the application of digital creativity in school.

The context is the classroom where children try to use digital tools and the teacher takes the role of a facilitator in order to elicit the application of these technologies in a creative way.

Commonly, the role-play boots new ways of thinking and a way to use objects and interact with people in real routine contexts. This method brings different dramatic instruments derived from sociodrama and psychodrama, such as replaying a scene or a part of a scene, role reversal, making asides, mirror and double [5]. These enactment

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[1]   https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.C_.2018.189.01.0001.01.ENG&toc=OJ%3AC%3A2018%3A189%3ATOC

[2] www.docent-project.eu

tools facilitate learners to explore their emotions, concepts and thoughts from a detached perspective, and the development of metacognition capacity. [24]

The DoCENT game give the opportunity to the teachers to test a real experience of classroom where they are able to apply the creative thinking with digital tools. Teacher could promote learner-centered methodologies, stimulate the autonomous learning, prevent and solve technical issues, manage collaboration between peers using digital interfaces, allow discovery and curiosity and finally propose a safe environment that encourages risk-taking behaviours.

The game is developed with three different scenarios that have the aim of the involvement of the teachers in the reflection of three different technological fields. In particular, the fields are: 1) coding activities for children (i.e. Scratch) [13, 25], 2) tangible user interfaces applications [6, 15, 17, 20], 3) STEM application with digital [13, 14]. The scenario, that was co-created with the teachers during specific co-design workshop in three countries (Italy, Spain and Greece) [7], are designed to:

- propose a real management of a class;
- allow the teacher or any kind of caregiver/tutor/parent to go deepen in real class environment in a safe way;
- test the interaction with students.

During the project, the researchers delivered a pedagogical framework [23], this aims the definition of digital creative teaching competences, thus the key-components of competences needed by teacher educators for effectively integrating digital creativity in teaching contexts, as well as to provide and validate an EU reference framework for developing and evaluating digital creative teaching competences.

Based on the structure of the DigCompEdu framework [3], the DoCENT pedagogical framework considers the professional and pedagogical competences of educators, as well as the development of students' competences. It is divided into six areas:

- Area A teachers' professional environment, i.e. application of technologies in collaboration with members of the educational community;
- Area B competences required to identify, create and share digital creative resources;
- Area C digital creative pedagogies, application of digital technologies in teaching and learning;
- Area D use of digital strategies to assess and foster students' creativity;
- Area E: potential of digital technologies for promoting learner-centred strategies;
- Area F focuses on the competences required to enhance students' digital creative competences.

Based on this structure, each scenario cover two areas listed before, in order to cover all the areas. An important module of the DoCENT game is the intelligent and Adaptive Tutoring System (ATS) [19]. The aim of this module is to produce a game interaction that can effect on the reply of the use, defining personalized paths. The system adapts itself based on the user interactions and provide at the end of session a feedback. This feedback describes all the interactions and choices during the game. At the end, there is a suggestion for the teacher to repeat or rethink about those scenarios or those interactions where the user has a greater margin of improvement. This feedback allows to

reflect on the class management and allows a re-play to try again the interaction with the classroom.
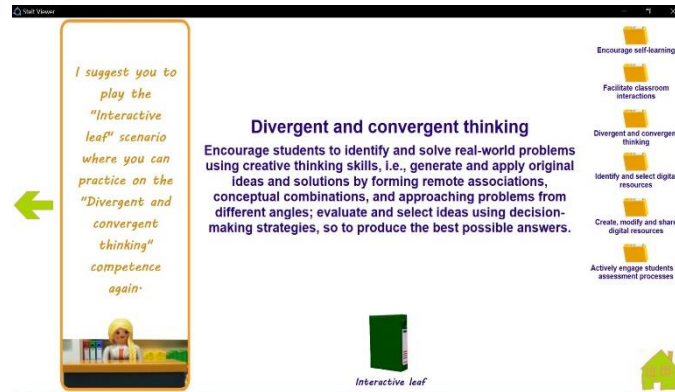

Fig. 1. The image shows a feedback in DoCENT Game with a suggestion based on the Adaptive Tutoring System that relates with the interaction of the user during the role-playing game.

3 Conclusion and future directions

The DoCENT Role Playing game is a serious game application developed for teachers and for teacher education in the field of digital creativity. The short paper shows the structure of the serious game and focus on the Intelligent and Adaptive module of the system.

The Serious Game developed proposes scenarios for teacher in three main field, namely: 1) coding activities for children (i.e. Scratch) [13, 25], 2) tangible user interfaces applications [6, 15, 17, 20], 3) STEM application with digital [13, 14]; supporting new frontiers of application that are a novelty for teachers. The game is downloadable from the project website, available for Microsoft.

The next step brings to the development of the Android App of DoCENT game for smartphones and the browser game.

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