'ACCORD' e-Platform:
Development and Evaluation of an Innovative Multicultural Training for School Professionals

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Abstract. The study aims at describing the development, application and evaluation of ACCORD, an innovative e-platform offering a free-accessible tailored multicultural training for school professionals through the application of current ICT research (e-learning, mobility, internet, artificial intelligence). The e-platform provided school professionals with a dedicated Massive Online Open Course (MOOC) and a Serious Game (SG), embedded within it, useful to enhance and (self-)evaluate their intercultural competences and negotiation abilities. Technological, Psychological, and Pedagogical models and approaches underpinned the methodology driving the creation of the e-platform contents. Following a pilot test, the edited version of the e-platform (including the SG, learning materials, lessons, questionnaires) was widely diffused in different languages (English, German, Italian, Flemish, Spanish). Pre- and post-training questionnaires were used to assess the learning experience and the efficacy of the training. Findings provided evidence supporting the learning effectiveness of ACCORD training. The experience with the e-platform has been positively rated by the users concerning both the technological and educational aspects. Overall, the study provided an overview on the creation, implementation and evaluation of a novel multicultural training tool, which has been proven to effectively foster the enhancement of intercultural and interethnic competencies of professionals working in the European educational contexts.

Keywords: Design tools/technologies, Serious Games, Games for learning, Development methodology, Multicultural Training, Teaching, Europe.
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1 Introduction

Nowadays, countries worldwide have become more and more multicultural and multi-ethnic [1], raising new changes and challenges, and requiring individuals to possess/achieve greater abilities to adapt to the increasing diversity featuring every context (e.g., work and private domains).

Within this portrait, also given the rapidly increasing diversity of the school-aged population, the education context was primarily demanded to successfully adjust to the above-mentioned changes, assuring that school professionals can actively foster inclusion, engaging in culturally competent educational practices [2].

Several policies, training programs and actions have been, therefore, proposed to support the school staff (i.e., school psychologists, teachers, educators, principals) in the development and/or strengthening of intercultural skills and competencies [3]. However, despite these clear efforts, teachers still reported needs to obtain further support in this direction, increasingly requiring tailored training tools for their professional development [4]. Teachers, indeed, are required to be constantly engaged in the achievement of optimal classroom management, promoting high-quality learning outcomes and a satisfactory class climate [5,6], so effectively acting in the contemporary multicultural classes.

2 The present study

The study aims at describing the development, application and evaluation of ACCORD, an e-platform offering a free-accessible tailored multicultural training for school professionals.

The study was developed as part of the ACCORD Project (Attain Cultural Integration through COnflict Resolution skill Development; www.accord-project.eu). The project was developed and implemented by five European countries (i.e., Italy, Spain, Belgium, Germany, and Austria). It aimed to prepare teachers, educators, and school professionals to deal with diversity and handle conflicts that might emerge in classrooms through a free, open online multicultural training course. ACCORD offers, indeed, a structured platform providing pedagogy and assessment methods fostering teachers and educators' enhancement and (self)assessment of their intercultural and negotiation competences.

In this perspective, the main drive for the ACCORD project came from the necessity to respond to the need emerged at European level, for a tailored, flexible, accessible, and affordable learning tool, which is capable of effectively allow teachers and educators to access informal learning pathways for the autonomous enhancement and evaluation of their intercultural competences. The rationale of the project was, therefore, that of addressing this need by bridging social skills improvement and assessment with the smart agenda proposed in the Europe 2020 strategy, which encourages the use of ICT methodology for extending the accessibility and the possibility of diffusion of key educational resources.

3   ACCORD e-platform: Development

3.1   ACCORD Methodology: Technological, Pedagogical, Psychological Approaches

The project and the e-platform contents (including the Serious Game, learning materials, lessons, questionnaires) were developed and framed basing on structured and validated technological, pedagogical and psychological models and approaches [7].

With respect to the technological framework, the design of the ACCORD contents and game scenarios follows the EduTechRPG methodological approach defined as Simulation Technology-drama based system [8,9].

The core elements of the EduTechRPG methodology resides in the gaming experience, underpinned by the modelling of relevant psychological and pedagogical theories, the use of simulation and artificial intelligence techniques, and the tutoring and assessment of users.

Specifically, these aspects of the EduTechRPG reflect the following two main dimensions:

(1) Psycho-pedagogical dimension: it defines the foundations of the learning approach adopted. In the case of the ACCORD game, this allows users to experience direct involvement within the learning environments/scenario, where they act through a personal dramatization by using a digital alter-ego, similarly to what occurs in face to face role-play activities.

(2) Technological dimension: it defines the technological approach. In the case of ACCORD, the SimTech approach was used. It allows the production of "artificial" micro-worlds based on computer-simulated, formal, models about social and psychological phenomena to which users interact with.

With respect to the pedagogical approach underpinning the creation of the project and e-platform contents [10], a competence framework was proposed, addressing three different conceptual dimensions: (1) intercultural literacy; (2) conflict management; (3) inclusive education.

These competences are, indeed, pivotal for living and acting in a culturally diverse society, contributing to creating a stimulating and constructive community.

Each competence area includes a set of descriptors classified into (a) knowledge and understanding - "I am aware of, know about and understand …"; (b) skills (cognitive and practical) - "I am able to …"; and (c) dispositions (beliefs, attitudes, values, commitment) - "I demonstrate". In total, the framework includes 30 descriptors.

To train teachers about the dimensions identified in the competence framework, three main pedagogical approaches have been adopted, i.e., digital education (i.e., the provision of MOOC and online learning contents), game-based learning (GBL) and scenario-based learning (SBL), the latter were specifically used for the Serious Game development. The integration and original use of digital technologies in education, indeed, allowed for making the training freely accessible, reaching more teachers, and sustaining users' autonomous interactive learning.

Following the technological and pedagogical foundations, ACCORD methodology is enriched by a rigorous psychological framework [11], that includes the two pivotal

theoretical models of Effective Communication [12] and Conflict Management Styles [13].

Moreover, the concept of Multicultural Personality [14] was targeted and, in particular, it was explored the association between teachers' multicultural personality traits and with their styles of handling conflicts. This, indeed, allowed to provide further meaningful indications regarding area and aspects on which the lessons and the role-playing learning scenarios needed to be focused.

3.2   National Surveys and Focus Groups

A systematic Training Needs Analysis (TNA) was, firstly, used to inform the design and the development of the ACCORD training program, involving teachers across the five partner countries. Different methods for data collection were used, i.e., an online National Survey has been administered to school professionals, and National focus groups have been organized in order to gather further insight into teachers and educators' perspectives and to gain information regarding their specific training needs in relation to inclusive education and intercultural conflict management.

Specifically, this preliminary phase consisted of:
(1) the diffusion of the National Surveys, in which teachers and educators were asked to complete an online questionnaire comprising the Multicultural Personality Questionnaire-Short Form (MPQ-SF [14]) and the Rahim Organizational Conflict Inventory-II, ROCI II (ROCI-II, Form B [13]), assessing, respectively, multicultural personality traits and conflict management styles;
(2) the implementation of Focus Groups with secondary schools teachers.

Overall 589 teachers completed the National Survey, while 69 participants have been involved, on a voluntary basis, in the Focus groups.

Findings directly fed the design of the MOOC contents as well as of the simulation scenarios of ACCORD game. Indeed, the information obtained was used both to understand the feasibility of the adoption of ACCORD tool and to make adjustments enhancing its efficacy, according to teachers' and educators' needs and perspectives.

In particular, teachers' contribution allowed to gain a greater understanding about how to create meaningful, realistic and engaging learning contents, mainly with respect to the serious game scenarios (i.e., proposing realistic conflictual situations teachers may potentially encounter in their daily school life, clarifying the content of the sentences, as well as the body language and facial expressions).

3.3   Development of the ACCORD e-platform: MOOC, Serious Game and Assessment tools

ACCORD MOOC
The MOOC (see Fig.1) has been designed to support teachers with in-depth multimedia material freely available online (video-lesson, slides, scripts). In particular, five lectures were proposed as follows:

- *Lesson 0.* ACCORD pedagogical framework;
- *Lesson 1.* Multicultural Personality dimensions and teachers' role in multi-ethnic classes;
- *Lesson 2.* Psychological models of conflict resolution: applications in the school context and within teacher-pupil interethnic interactions;
- *Lesson 3.* The use of Serious Games in the school context: ACCORD games for Teacher-pupils inter-ethnic and intercultural interactions;
- *Lesson 4.* Theoretical framing interethnic conflicts in the classroom: perspectives derived from sociology, anthropology and social psychology.
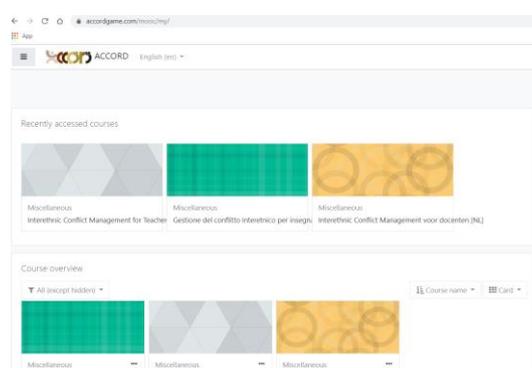
Fig 1. ACCORD MOOC e-platform

Serious Game

Given the growing evidence on the potential of serious games to effectively support learning [15-18], ACCORD MOOC was originally enriched and increased in interactivity through the inclusion of a Serious Game.

ACCORD Serious Game is a single-player tool to train intercultural communication and negotiation skills through realistic scenarios, during the interaction with artificial agents. It aims to cross the boundaries between educational games and Intelligent Tutoring Systems (ITSs), merging the significance of online and dynamical learner training with intrinsic and extrinsic motivating environments of serious games [15-18].

The game consists of the simulation of a dialogue between two characters, implemented as 3D avatars (i.e., one of those represents the teacher, controlled by the user, and the one other represents the student, that is computer-controlled). Both the agents, namely the teacher and the student-counterpart, are able to perform basic expressions using verbal and non-verbal indicators (e.g., body gesture, facial expression), that were in line with the communication model of assertiveness, passivity and aggression [12].

Each scenario was developed to encompass a particular type of interethnic conflict in the classroom context, according to the theoretical frameworks selected (see 3.1) and personalized basing on findings from the National Surveys and Focus Groups (see 3.2). In total, five different scenarios have been proposed.

Within the game process, the user can experience different communicative and conflict management strategies in a protected context. The user is given the opportunity to choose one among five/seven possible sentences based on the five styles of Rahim's Model [13], i.e., covering integrating, compromising, obliging, avoiding, and dominating styles (appropriate and/or inappropriate depending on the situation to be handled) (see Fig.2).

Fig. 2. ACCORD Game: Teacher-student interaction

At the end of the gaming experience, teachers were provided with a comprehensive and targeted debriefing about their negotiation path (see Fig. 3). This completely self-sustained assessment system allows teachers to become aware of personal handling conflict styles and related skills particularly relevant to successfully act in and adjust to multicultural classes. Moreover, teachers may be induced to also reflect on the possibility to adopt a broader range of strategies, searching for moment-to-moment solutions according to the specific situation to be handled [6], so achieving an optimal conflict management strategy within the class.
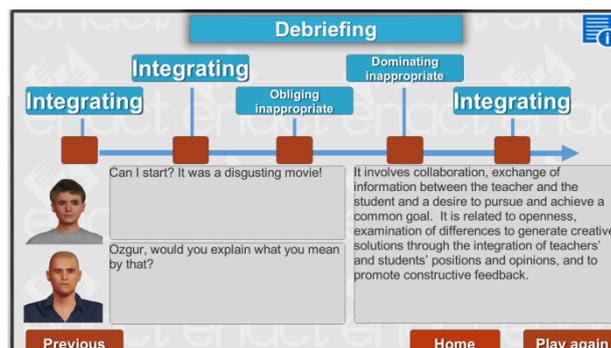
Fig. 3. ACCORD Game: Comprehensive Debriefing

Assessment Tools

The assessment path of the e-platform included questionnaires to: (1) explore users' conflict management skills; (2) assess personal experiences regarding both the learning path undertaken and the conflict and multicultural dimensions explored; (3) understand the degree of acceptance of the Accord MOOC and Game. This, indeed, allowed to assess the training effectiveness as well as users' perceived learning development.

4   ACCORD e-platform: Evaluation Results

To evaluate and test the adequacy and efficacy of ACCORD e-platform, teachers' intercultural competence development and enhancement, as well as their attitude toward the proposed gaming and learning experience were assessed. The evaluation phase was, indeed, crucial for understanding the training efficacy, as well as the propensity of teachers and educators to adopt modern digital tools, such as serious games, for their own learning, and eventually in their teaching practice.

Before testing the ACCORD e-platform, a preliminary pilot test has been run by using a paper-based prototype and the think-aloud protocol. In-service and pre-service teachers and educators, as well as members of the ACCORD consortium, were involved.

The aim of this phase was to identify potential technical shortcomings of the adapted integrated platform that could reduce the effectiveness of the learning experience (e.g., usability problems, issues in the basic game and scenarios design, problems with the artificial intelligent tutor). Feedbacks were collected and used to refine and improve the final version of the ACCORD e-platform.

Afterwards, the final version of ACCORD e-platform was widely diffused in the languages of the respective partner countries (Germany/Austria; Spain, Italy, Netherlands), as well as in English. Figure 4 illustrates users interacting with ACCORD e-platform during dissemination events (see Fig.4)

Fig. 4. Interactions of users with ACCORD e-platform

Evaluation of Learning Achievements: Results

As already mentioned (see 3.3), a total of five learning units were offered. After each lesson, participants were asked to answer questions specifically developed to evaluate the acquisition of the content provided through the learning material (e.g., video-lesson, slides, scripts). For these questions, the percentages of the right answers were calculated.

Data revealed that 85.06 % of the correct answers were given for Lesson 0, 88.66% for Lesson 1, 88.53% for Lesson 2, 73.67% for Lesson 3, and 75.50% for Lesson 4, providing encouraging evidence informing on the acquisition of learning contents.

Additionally, a "reflection on experience questionnaire" was placed straight after each lesson. The first question was an open question that asked for a little text about personal experience. Afterwards, questions addressing the usefulness of the competencies covered in the ACCORD framework were given.

Overall, data revealed that the majority of participants positively rated the usefulness of the competencies developed in ACCORD (i.e., defined as absolutely required or required). This clear result suggested that the models developed in the ACCORD project precisely address their professional development needs.

Furthermore, participants were asked to assess their knowledge before and after the lessons. This section aimed to reflect the changes in the three areas of the competence framework (intercultural literacy, inclusive education and conflict management), by testing whether there was an increase, decrease or no change in the participants' perceived levels of knowledge.

For the majority of participants, a statistically significant increase in knowledge for each lesson was found. It can be, therefore, concluded that participants benefited from all ACCORD lessons in terms of competences enhancement.

Evaluation of ACCORD MOOC and Gaming Experience: Results

To assess the acceptance of the ACCORD MOOC and Serious Game, the participants were asked to evaluate different aspects, i.e., Perceived Usefulness, Subjective Norm, Image, Job Relevance, Output Quality, Result Demonstrability, Perceived Ease of Use, Computer Self-Efficacy, Perceptions of External Control, Serious Games Anxiety, Perceived Enjoyment, Voluntariness, Behavioral Intention [19,20].

The overall feedback was positive, and data confirmed teachers' and educators' acceptance of both the ACCORD MOOC and ACCORD game for their training and teaching practice.

Findings provided, therefore, promising evidence on the willingness of teachers and educators to use ICT tools at European level, so sustaining the possibility for the systematic adoption of such tools in curricula and government practice in teachers CPD and initial formation.

5 Conclusions

In conclusion, the present study described in detail the development, application and evaluation of an innovative e-platform, namely ACCORD, offering a free-accessible tailored multicultural training for school professionals.

The ACCORD project developed and implemented an open online learning platform providing pedagogical resources and activities to support school teachers to constructively manage intercultural conflicts which may arise in the classroom, as well as to create positive learning environments and to address intercultural diversity in the classroom.

The assessment phase results of the ACCORD project provided encouraging evidence on its learning effectiveness. Findings also suggested that the experiences proposed through the ACCORD training tool can raise awareness and boost the development of intercultural and interethnic conflict management competences.

Therefore, we are confident that ACCORD tool is able to successfully respond to teacher' need to obtain tailored multicultural training courses to enhance individual and professional competences that may be transferred to situations in real-world school contexts at the European level.

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