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ORIGINAL

An interdisciplinary study in initial teacher training

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ABSTRACT

This experiment of innovative university education shows the interdisciplinary work carried out in the studies of the Bachelor of Science in Education at the University of Andorra. The study was developed within two subjects: Communication Technology (TAC) and Cultural Heritage Education in Andorra.

The main objective of this experiment is to foster the use of technological resources and digital materials, with the aim of drawing cultural heritage closer to the classroom. Based on a previous study of documentation and an analysis of online educational materials, the students have to design an e-book, which is understood to be digital material in the curricular field of cultural heritage. This digital material is a didactic proposal that focuses on the construction of knowledge by primary school students. During the elaboration of the materials the instructors introduce follow-up activities. The results of the experiment show that, from an interdisciplinary approach, and a problem-solving, learning-centered methodology, specific and transferable abilities in initial teacher training can be studied and evaluated.

KEYWORDS: TEACHER TRAINING, HIGHER EDUCATION, ON- LINE RESOURCES, EDUCATIONAL TECHNOLOGY

1 BACKGROUND

The new educational model implemented in European universities focuses on the development of two sets of competences: (1) Specific competences in each degree, considered as essential for the development of a particular profession and (2) cross-curricular competences in all degrees. The latter, apart from being transferable to different professional environments, also enable constant adaptation to a continually changing labor market (Gisbert, Cela, & Isus, 2010). These cross-curricular requirements must be met by all university graduates regardless of the studies they have taken (Cela & Gisbert, 2010).

The pedagogical model based on the development of competencies implies the ability to understand, and know how to apply, theoretical knowledge; in other words, we are dealing with constructivist learning. Within this paradigm students are capable of transferring knowledge to new situations at the same time that they develop critical thinking abilities (Feger, Woleck, & Hickman, 2004), and accept responsibility for their learning. This process also involves teacher guidance and support throughout the learning process. Thanks to the use of specific tools, the traditional model is replaced by learning environments based on real contexts. Moreover, mutual understanding and peer cooperation are also perceived as key issues (Basque, Doré, & Henri, 2000). This meaningful learning environment is of paramount importance in order to improve the educational experience. Lastly, it is generally accepted that students who participate in this type of activities learn more and retain more of what they learned (La Roche & Flanigan, 2013).

The curriculum for compulsory studies at the University of Andorra has been developed by a group of experts made up of university representatives, ministry representatives, members from the professional schools involved and representatives of Andorra's University Quality Agency. These groups have been in charge of the evaluation of professional and academic qualifications that meet the European Higher Education Area (EHEA) standards, and that are also consonant with the social, economic, and professional context of the country.

The incorporation of competences within the curricula, and therefore in the general guidelines for the different courses, calls for a pedagogical revolution that comprises a methodological change in the academic sphere- a change that has already taken place in the levels preceding higher education.

The University of Andorra, which offers regulated higher education studies adapted to the EHEA standards, has adopted a pedagogical model that integrates the learning of competences into the different curricula. This model is based on continuous assessment, which is regarded as a fundamental resource to help teachers and students make decisions to improve learning. This evaluation process lets us gather information on the student's learning process.

Continuous assessment consists of a series of activities (between 3 and 5) that are presented, developed and evaluated throughout the semester. Each activity has one or more specific and transferable competences assigned to it. Each skill is

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accompanied by a rubric that grades it in terms of learning outcomes, according to three different levels of complexity.

Each degree has a map of specific competences that should allow the student to be aware of the timing and intensity with which each skill is practiced in each subject. This general competencies map allows us to plot skill development (Garcia & Gairín, 2011). In order to ensure that competences are effectively developed they are gradually implemented, always by associating them with the ongoing assessment exercises of the subjects involved. Therefore, students in any of the three academic years, who are gradually working with the three levels of competence, are selected.

In this paper we present a study of innovative education at the University of Andorra, conducted with sophomores of the Bachelor of Science in Education. The study focuses on an interdisciplinary project between two compulsory subjects: TAC and Cultural Heritage Education in Andorra

The current design of the TAC course was developed in the academic year 2009-2010 (Carrera, Larraz, & Coiduras, 2010), but the project on educational innovation and interdisciplinary work between the two subjects started during the 2011-2012 academic year.

2 THEORETICAL BACKGROUND

The three pillars supporting this experiment, the e-book, are interdisciplinary learning, team-based problem solving and teamwork learning.

Interdisciplinary learning is understood as an approach to an integrated curriculum, in contrast with a discipline-based curriculum: "The integrated curriculum encourages the development of learning which is closer to professional practice" (Arandia & Fernandez, 2012, p.99). It should be pointed out that typical professional problems of the 21st century cannot be tackled solely from individual disciplines, but rather from interdisciplinary spheres (Max-Neef, 2005). It is through joint effort that mutual enrichment is sought, even to the point that disciplines rely on each other, taking into account that dependence sometimes brings about changes in the initial approach to subjects. "Interdisciplinary work allows one to face complexity and understand the relationships between the parts and the whole" (Pérez-Gómez, 2008, p.89). In addition, interdisciplinary work also fosters "understanding, globalization and the integration of subject content" (Fraile, 2012, p.9) as well as the transfer of knowledge. Therefore, for the competences approach to succeed it is necessary to overcome the logic of disciplines (Bolívar, 2008; Gimeno-Sexton, 2008; Zabala & Arnau, 2008).

As already mentioned in the previous section, the study presented in this paper is based on an interdisciplinary project between two subjects. The meeting point between these two subjects is the use of technology. On one hand, "the teacher, as an essential agent in the community, should be trained in the use and mastery of ICT to promote its use in education and integration in schools" (Romero, Gisbert, & Carrera, 2009, p.2). On the other hand, the relationship between technology and museums, originally perceived as a threat, is now considered as an ally to study, transmit and disseminate cultural heritage (Hawkey 2004; Yáñez & Gisbert, 2012).

Problem-based learning (PBL) is a methodology that requires developing learning attitudes to construct knowledge through the ability to solve a given situation that is based on real problems (Steiner & Posch, 2006). This e-book study raises an issue that is closely related to the teaching profession. As described in the article published in the monograph issue (November 2012) of the periodical review *Aula de Innovación educativa*, PBL is one of the strategies to be born in mind in the curricular integration of competences. Among others, "PBL promotes the development of research competences, information management and research" (UPC, 2008, p.5).

Savery (2006) argues that PBL has to be the pedagogical basis of curricula and not just a part of a single program. The author summarizes the main characteristics of PBL in relation to the problem situation and students' role. The situations in PBL should be based on the integration of different disciplines, as it happens in real life, and should not be structured. On the contrary, these situations should make it possible for individuals to engage in cooperation and joint research. Students must take responsibility for their own learning, and must have an active role that lets them apply the knowledge acquired in order to solve problems. Therefore, they are evaluated throughout the whole process.

Applied research in museums and cultural heritage allows experimentation with digital educational tools, seeking to bring about new ways of teaching and learning (Yánez & Gisbert, 2012). Bearing this in mind, the present project seeks to practice the competences in both subjects holistically.

Cooperative work accompanying the PBL encourages organization, self-management, resolution of conflicts of interest and consensual decision making. All these aspects, together with the high diversity that characterizes group members, offer great learning opportunities (Pujolàs, 2003), "necessary to promote the development of some basic competences, such as communication and methodology" (Pujolàs, 2008, p.259). In addition, different studies show a positive relationship between i) cooperative learning and student's academic achievement and ii) attitudes towards learning (Johnson, Johnson, & Smith 2007). The present project, organized in accordance with the general characteristics of cooperative work, is carried out in groups of 2-3 students taking the first year course Teamwork. Groups are small in order to enable students to work together and maximize their own learning and that of others (Johnson & Johnson, 2010). As regards the number of students per group, we have followed Johnson, Johnson and Holubec's recommendations (1999): (1) the smaller the group, the easier it will be to detect difficulties, (2) the smaller the group, the more difficult it will be for a member to fail to do his job, and (3) the shorter the time available, the smaller the learning group should be.

These three pillars supporting the e-book project encourage and strengthen the competences-based approach in which we are immersed in higher education. It also allows trainee teachers to practice transferable technological competences, at the same time considering the necessary link between research and practice (Ping, 2013).

Creating the e-book fosters the development of competences through a process of reflection and creativity in which students move from their role as consumers of knowledge and technological resources to that of creators (Kennedy, 2010). In addition, it allows us to understand the technological environment as an ecosystem that will promote learning through a new, active relationship between man and machine (Gruber, 2008).

3 AIMS

The main aim of our project was to design an e-book about Andorra's cultural heritage, understood as a digital educational resource and designed for students of primary education.

The general aim of the study is further developed in the following specific aims:

(1) Documenting work processes performed individually and in teams.
(2) Using 2.0 edition web tools efficiently in the creation of educational materials applied to allow cooperation between schools, museums and cultural heritage institutions.
(3) Increasing the digital competence of trainee teachers in the applied use of ICT through a Problem-Based Learning and Project Guided Learning methodology.
(4) Promoting good teaching practices for the integration of technology in the classroom.

4 METHODOLOGY

4.1 Participants

The experiment was conducted with sophomores in the Bachelor of Science in Education (teacher training) taking the compulsory subjects TAC and Cultural Heritage Education in Andorra at the same time.

The project was designed and supervised by Dr. Jordi Coiduras and Dr. Xavier Carreras (University of Lleida), through a pilot test conducted at the University of Andorra throughout the 2009/2010 academic year.

The project has been conducted for the last two academic years (2011/2012 and 2012/2013), with groups of approximately 15 students per year. The project's workload is 2 ECTS (three class hours per week, for two months), plus various tutorial sessions with each group.

This project of educational innovation in higher education brings together the knowledge and competences from both subjects, TAC and Cultural Heritage Education in Andorra. At the same time, the problem-solving methodology proposal fits well within the strategy of guided discovery learning.

4.2 Structure

The methodology of this interdisciplinary project on the introduction of technology in the classroom is organized according to the following structure: Research and analysis, Editing, Follow-up and Defense Project.

Research and analysis: in the first stage students must demonstrate competences in accessing and processing information in both subjects. These abilities are essential for the development of digital capability (Webber & Johnston, 2003; Leu, Kinzer, Coiro, & Cammack, 2004; Calvani, Fini, & Ranieri, 2009; Illomäki, Kantosalo, & Lakkala, 2010; Larraz, 2013). On the one hand, students must analyze online educational materials, and on the other they should be able to identify and analyze documentation in appropriate sources.

Editing: in the second stage students should be capable of selecting and applying the necessary multimedia tools for the proposed didactic purpose: to bring cultural heritage closer to the classroom using virtual learning materials. Students create their own digital materials in various formats and languages by editing tools online (Carrera et al., 2010).

Follow-up: throughout the project, instructors conduct monitoring activities in order to help focus and improve the work on the e-book in each group. Monitoring activities are:

Diary: students individually and systematically document the working process. They create periodical posts for a personal forum created within the virtual campus, accessible to students and to both instructors. Reflecting on the learning process is perceived "as a way to promote and encourage metacognition and to develop autonomy and learning regulation" (Pérez-Gómez, 2008, p.91). The Diary is a personal space within a group project that enables supervision and guidance by the teacher. This supervision increases and consolidates students' efficacy, which in turn helps improving group dynamics (Van Dinther, Dochy, & Mien, 2011). Journaling is a very useful tool for both instructors, since they are able to monitor students' personal development and evolution over time (Carrera et al., 2010).

Group tutorials: in which group members respond to methodology and content concerns. Feedback is the key strategy that can promote formative assessment (Fluckiger, Tixier, Pasco, & Danielson, 2010; Nicola & Macfarlane-Dickb, 2006). The feedback provided by instructors focuses on the modification of students' ideas or attitudes so as to improve learning (Shute, 2007). In order for feedback to be effective it has to be meaningful and should be administered following the presentation (Wilson & Scalise, 2006). This space offers instructors the opportunity to observe firsthand the progression of the project, which becomes fundamental in order to provide adequate guidance and support to each group (UPC, 2008).

Partial Presentations: in front of the class. Both instructors and students explain the work developed up to a certain point, what remains to be done and the main questions so far. These presentations are useful to guide and redirect the working process, and also become useful training for the final presentation.

Defense project: there will be a joint assessment by both instructors: students must submit the final product, highlighting its feasibility *and* explaining how to implement it, as well as the benefits and limitations of its implementation.

Panel of experts: the experts analyze the effects of the introduction of technology in the classroom. This project was presented at the "II Conference of Educational Reflection" in La Seu d'Urgell and Andorra. It was presented to a group of teachers from different educational levels, and also to experts with extensive experience in the use of multimedia materials as a tool for improving teaching practice.

4.3 Instruments

The project was evaluated by means of the following instruments:

— Diary Rubric to assess the level of student reflection. The rubric consists of four levels that assess the quality of the interventions. The following table shows the relationship between the rating system and the corresponding criteria.

Table 1. Diary Rubric

Score	Criterion
0	It provides no relevant information
1	The reflections are related to work evolution
2	The reflections are related to work construction
3	The reflections are related to the learning process

— Assessment scale (numeric and descriptive) for the evaluation of e-book quality. The evaluation criteria are organized into three categories: (1) information architecture, in which the structure is valued as much as the relationship between objectives, content, activities and tools, (2) viability of the e-book in relation to the age group addressed, the specific curricular goals, the adequacy of the instruments chosen and the activities designed, and (3) the communication strategy, in which the three levels of communication are considered: written, visual and oral. The following table shows the relationship between the categories and indicators of the proficiency levels for transversal competences at the University of Andorra, as well as the specific competences for the Bachelor of Science in Education.

Table 2. List of categories, indicators and competencies of the rating scale for the e-book

Categories	Indicators	Levels of competence mastery
Information Architecture	Clear, consistent and well-organized structure	UdA0513i: Decides which information sources are the most convenient UdA0213: Decides the way to develop work so that it can become high-quality work. UdA0613: Decides on work management and planning
	Interrelation between objectives, contents and activities and web 2.0 instruments	
Viability	Adequacy to the ages to which the material is addressed	BCE223: Designs learning situations that incorporate representations of the curricular content and original as well as creative methodologies. BCE623: Designs and creates digital materials of different typology with multimedia elements adapted to educational situations. BCE633: Adapts the software to its needs BCE513: Produces new manners to promote culture, values and identity UdA0313: Elaborates own projects incorporating proposals to improve the country's socio-economic and cultural atmosphere
	Objectives adapted to the curriculum	
	Contents suited to age	
	Diversified, significant activities oriented to encourage participation and to knowledge construction.	
	Suitability of the main edition instrument	
	Suitability of the secondary web 2.0 instruments	
	Didactic guide which specifies the use of the e-notebook by the teaching staff.	
Communication strategy	Written communication: clarity in the presentation	UdA1012: Argues the ideas in an appropriate way and properly adapted to the discourse, to the target audience and to the different situations in the academic context.
	Visual communication: aesthetics and creativity	
	Oral communication: clarity in the exposition	

— Rubric digital competence (RCD) (Larraz, 2013): used to assess students' level of digital literacy. The rubric consists of four dimensions (information, technological, media and communication literacy) and of 21 learning outcomes, each of them graded according to four difficulty levels.

Table 3. Rubric digital competence.

Dimensions	Learning outcomes
Informational literacy	Clearly identifies the problem and defines the goals set. Identifies the information needed to provide a solution for one problem. Utilizes and selects information sources. Critically analyzes the information located. Manages the information selected. Manages the registration of information. Transforms information into own knowledge.
Technological literacy	Manages the hardware. Utilizes the software as a work tool. Adequately deals with the data in different, formats (text, graphic, sound, image in motion, hypertext).
Multimedia literacy	Understands the meaning of multimedia messages. Assesses the style of multimedia messages. Critically analyzes multimedia messages. Selects the messages in a suitable way to elaborate own messages. Creates multimedia messages. Distributes the multimedia message through the communication channels.
Communicative literacy	Presents the information adequately for the objective and for the audience to which it is addressed. Spreads the knowledge acquired. Communicates online and offline. Utilizes the resources of digital citizenship. Works collaboratively.

— Panel of experts: to analyze the effects of the introduction of technology in the classroom. The panel was made up of 12 teachers (five men and seven women), of which 75% had over 25 years of teaching experience. The distribution of the experts according to educational level was as follows: one for pre-school, two for elementary school, two for junior high school, four for high school and three for higher education.

4.4 Analysis

The data collected through the various instruments have been analyzed as follows.

— The results obtained from the Diary are analyzed in the paper through the rubric exposed and discussed in the previous section (see Table 1). Each input receives a score, from zero to three. The final grade is obtained from the arithmetic mean of all interventions.

— The results about the e-book are extracted from the evaluation of the three categories explained in the previous section (see Table 2). Indicators in each category are evaluated. The grade for each category represents one third of the final grade for the e-book.

— Digital competence is evaluated by means of the RCD, which consists of four areas. Learning outcomes are evaluated, so that a score between one and four is obtained for each area.

— The contributions made by the panel are evaluated qualitatively, gathering the responses according to similarity or conceptual closeness.

5 RESULTS

In this section we present the main results obtained for each of the main aims of the study.

5.1 Reflective documentation

The results presented here are related to aim 1: *Documenting work processes performed individually and in teams.*

All the work processes carried out throughout the development of the activity have been documented individually and systematically. The students have made weekly entries in the diary folder of the virtual classroom forum. The entry made reference to the advances in the elaboration of the e-book, the problems encountered, solutions found, possible questions to solve and work plans for the following weeks.

As regards monitoring and self-regulation of the elaboration of the e-book, diary interventions have been assessed using the Diary Rubric.

The qualifications obtained (between zero and three) in each of the five interventions show that, while at the beginning of the process the information provided is not relevant, or only relates to the elaboration of the materials, as work progresses there is a greater quality of performance.

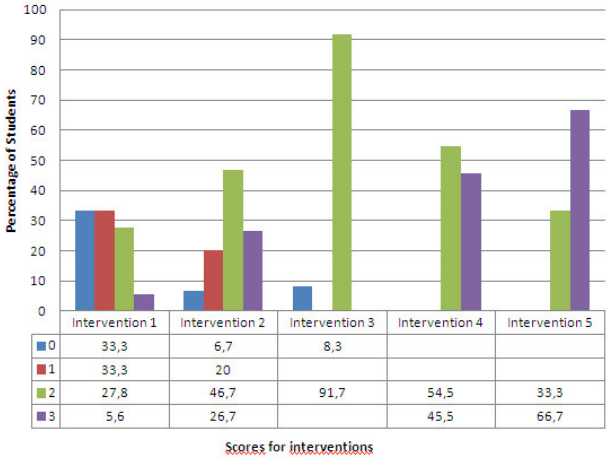

Figure 1. Percentage of students according to the grades obtained in each intervention

5.2 Efficient use of digitals tools

The results presented here are related to aim 2: *Using 2.0 edition web tools efficiently in the creation of educational materials applied to allow cooperation between schools, museums and cultural heritage institutions.*

The analysis and assessment have been carried out by means of a numerical and descriptive assessment scale (see Table 2). The scale includes indicators that have been linked to the transferable competences assigned to this specific activity.

The average qualification obtained in the e-book was 8.5. Accordingly, we believe that this project allows students to successfully meet the indicators in the grading scale. The results show that this interdisciplinary project fosters the integration of good teaching practice following the integration of technologies. A more detailed study of the e-books shows that most students selected second cycle students (aged from eight to ten) and third cycle students (aged 10 to 12) of Primary Education as the final users of the materials. In our case, the content related to Andorra's cultural heritage, worked on and selected by the students, can be categorized into three groups: (1) e-books that focus on the study of the heritage of a particular region of the country, (2) e-books that focus on the study of some aspect of Andorran history (such as the influence of the industrialization process, Romanesque art or the transition to full sovereignty) and (3) e-books that focus on the study of cultural issues in the country, as for instance political organization.

The resources used as the main editing tools have been free content managers, flexible enough to design the didactic proposal with all its own paragraphs (presentation, activities, access to resources, spaces for the construction of knowledge, evaluation criteria and teacher's guide).

The 2.0 web tools, used as secondary tools, meet the requirement of contributing to the construction of knowledge by students through active participation. The tools most used were: the development of video resources, stories, chronological friezes, geo-location, family trees, Google and general information. In addition, students selected instruments that also favored collaborative work in the construction of knowledge, such as wikis and blogs. Students selected and designed the tools, at the same time testing the extent to which they could be implemented in the classroom. Most activities that require the use of these tools also entail students' cooperative work.

An added value is that students must provide curricular content with the e-books. Given that published digital material on the country's cultural heritage is rather scarce, many groups have been forced to create their own curricular content, for which they have turned to digital presentations, blog entries, wikis, websites and playful activities on heritage aspects, like alphabet soups, crosswords and puzzles.

5.3 Digital competence

The results presented here are related to aim 3: *Increasing the digital competence of trainee teachers in the applied use of ICT through a Problem-Based Learning and Project Guided Learning methodology.*

Once the e-books had been elaborated, students' digital competence was assessed. For the evaluation we used the Rubric for Digital Competence (RCD). The rubric is formed by four dimensions that correspond to the four capabilities comprised in the skill. Each literacy is structured according to learning outcomes, and each outcome is further subdivided into four levels. The following table shows the average grades awarded by students themselves and by both instructors. The interval ranges from one to four, and the average score for each literacy is always above three.

Table 4. Evaluation of students' digital competence

Digital competence	Students	Professor 1	Professor 2
Informational literacy	3.2	3.13	3.02
Technological literacy	3.08	3.14	3.22
Multimedia literacy	3.19	3.05	3.21
Communicative literacy	3.21	3.06	3.14

5.4 Good teaching practices

The results presented here are related to aim 4: *Promoting good teaching practices for the integration of technology in the classroom.*

This project was presented to a group of experts, with the aim of identifying, discussing and reflecting on the possible effects of the introduction of technology in the classroom, both as regards individual behavior as well as in terms of collective effects on the educational context.

The debate resulted in the identification of the key issues regarding the benefits or drawbacks of the use of technology in the classroom. A series of key issues was established in order to assess the changes that may be brought about by the presence or absence of technology. The results are grouped around six main topics:

Access to and information processing:

- Training in technological literacy
- Fostering knowledge of both Web 2.0 and ICT and of cultural heritage
- Bearing in mind students' heterogeneous profile
- Right to access information

Case resolution

- Need to bring reality and education closer
- Using the classroom as a laboratory
- Online resolution of problems
- Learning to be critical
- Learning to be resolute
- Developing the capacity to generate ideas and turn them into projects
- Promoting collaborative learning

Interest for culture

- Fostering interest for culture
- Avoiding superficiality
- Being able to approach knowledge in its complexity, approaching it as the superposition of layers
- Using technology as a resource
- Keeping in mind the volatility of network information
- Promoting the culture of effort versus immediacy
- The need for time for reflection
- Being capable of performing complex searches
- Understanding technology as a means, and not as an end
- Reflecting on the implications of technology loss

Technology as a tool:

- Working on the premise that technology is a tool
- Using technology as just one more resource among many others, not as the only one
- Avoiding superficial motivation and the illusory effect of technology
- Choosing the most appropriate technology for each particular purpose
- Learning not to rely on technology more than necessary
- Considering the multiple perspectives offered by technology

The teacher's role:

- Acknowledging that investing in education is critical to the development of a country
- Developing the ability to inspire and surprise without relying on technology in excess
- Being able to stimulate thinking
- Being critical with results
- Working so that schools regain interest in culture and in-depth knowledge
- Reflecting on ongoing evaluation activities of the initial teacher-training curriculum

6 CONCLUSIONS

Having explained the project and the main results obtained, next we present the conclusions that result from the analysis of the interdisciplinary study.

- The elaboration of reflective documentation on the work processes has allowed students to become aware of the evolution of their work, thus identifying their limitations as well as strengths and opportunities for improvement. At the same time it has enabled instructors to track and offer personalized learning support that is both timely and appropriate to each situation.
- The elaboration of the e-book, resulting from the integration of two subjects, has enabled students to apply the knowledge acquired in the two disciplines in an interrelated way. This has helped them address the resolution of the problem creatively.
- The design of the study between the two subjects (TAC and Cultural Heritage Education in Andorra) helps us understand the use of technology as a pedagogical tool versus understanding technology as an end in itself.
- The interdisciplinary study is an opportunity for teachers to work cooperatively in the design, implementation and evaluation of an educational activity. This situation has many advantages: (1) it broadens disciplinary boundaries, (2) it favors consensus through joint planning, (3) it involves the creation of common aims and evaluating criteria, (4) it requires a reflective process on the instructor's own teaching practice and, finally (5) it involves peer cooperation and learning.
- Cooperative work involves taking responsibility, individually and collectively, for the final product (the e-book), thus enhancing the capacity for dialogue and consensus among all groups members.
- The experiment allows digital competences to be accredited through the rubric.
- The e-books developed by the students constitute new teaching material, available online, that can be used in schools to teach a very specific curricular area.

At the beginning of this article we stated that the University of Andorra is involved in the implementation of a new educational model based on the development of competences.

The interdisciplinary project portrayed here represents an example of the incorporation of specific and transferable

competencesaz to education, considered an example of practical application. In the implementation of the project a number of tools have been utilized, such as the rubric for the diary and the rating scale, which can also be used in other disciplinary areas. The tools can be applied to assess activities aimed at i) reflecting on the learning process and ii) developing educational proposals based on the binomial 'technology plus curricular content'.

The benefits of interdisciplinary work are substantial, both from the point of view of the integration of content into a more meaningful learning experience, as regards collaborative work among instructors. Therefore, as an immediate challenge, we would like to implement the present methodology in similar studies between other disciplines at different levels.

Finally, it is important to mention that we are currently elaborating the third version of the project. Among other modifications, the opinions generated by the group of experts have been incorporated into the new design. Among these opinions, we would like to highlight the need to regain interest in culture and the need to work seeking in-depth knowledge. We understand that only from an open and voluntary approach to the plurality of knowledge (both academic and popular) may complex thought be developed and contribute to the education of competent citizens.

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NOTES

[i] The nomenclature UdAxxx indicates that it is a transversal competence of the University, whereas the nomenclature BCExxx indicates that it is a specific competence corresponding to the Bachelor of Science in Education. The last digit (1, 2 or 3) indicates the level of mastery for each competence, 1 being the most basic, and 3 the most complex.