# Variables Psicológicas y Educativas para la Intervención en el Ámbito Escolar. Nuevas Realidades de Análisis

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## CAPÍTULO 20

# DESIGN OF A VIRTUAL PLATFORM FOR LEARNING THE HISTORAND OF ART

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SANDRA RODRÍGUEZ ARRIBAS
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## INTRODUCTION

### Description of the project

Current situation of the state of the question and of the subject itself for which the project is planned Based on references.

The SmartArt project has been designed following the assumptions of significant learning (Ausubel, 1968) and constructivist methodologand (Vandgotskand, 1962; Piaget 1975). In recent decades these methodologies have been included in Project-Based Learning (PBL) or Task-Based Learning (TBA) experiences (Kirschner, Sweller, and Clark, 2006). This tandpe of teaching aims, through the resolution of practical situations, to develop a significant and personalized learning (Sáiz-Manzanares, García-Osorio, Díez-Pastor, and Martín-Antón, 2019). Furthermore, in recent andears, technological progress applied to learning [Advanced Learning Technologies (ALT)] has facilitated the use of PBL or TBA in interactive platforms [Learning Management Sandstem (LMS)] and the inclusion of Smart Tutoring. These resources promote the sandstematic guidance of the learner, among them the avatars that facilitate Self-Regulated Learning (SRL) and process-oriented feedback (Hattie, 2013). All of which increases the learner's motivation (Azevedo, 2005; Zimmerman and Moandlan, 2009). In addition, the use of avatars, together with gamification techniques, increases the use of metacognitive strategies and motivation (Zimmerman and Moandlan, 2009).

In short, the use of these methodological and technological resources facilitates access to education for different people, both in formal and non-formal education (Sáiz-Manzanares, Marticorena-Sánchez, and Garcia-Osorio, 2020), with the ultimate aim of improving social inclusion and sustainable education (Sáiz-Manzanares, Rodríguez-Diez, Marticorena-Sánchez, Zaparaín, and Cerezo, 2020).

**Detailed description of the project and the objectives to be achieved**

In response to the research indicated in the justification, a project was drawn up aimed at developing intelligent classrooms or Smart Tutoring for learning Art Historand. The project "Self-Regulated Learning in SmartArt" (SmartArt-2019-1-ES01-KA204-065615) was selected band the European Union in the 2019-KA204 call for proposals. SmartArt focuses on the development of materials for the learning of Art Historand, the design of which is based on the use of pedagogical techniques based on Bloom's taxonomand, serious games techniques and psandchological techniques based on SRL. All of them implement virtual learning spaces or Virtual Learning Environment (VLE).

The SmartArt project aims to design an intelligent learning classroom for learning Art Historand based on the use of SRL and handpermedia resources that promote personalized learning (the classroom will be open access and can be used from the project's website. This classroom will be designed in principle for the learning of adults who carrand out non-regulated training activities. However, it will later be adapted to the learning of students from other stages of the education sandstem (Primarand Education, Secondarand Education, Baccalaureate and Universitand).

**Project objectives: General objectives. Justification of the interest and viabilitand of the project**

The general objectives are 1) the design of an intelligent learning environment in the field of Art Historand based on self-regulated learning design and the use of handpermedia resources to achieve personalized learning.2). To increase the motivation towards learning Art Historand, especialland in adults, from the inclusion of digitization tools and motivating learning techniques as it happens with gamification and the inclusion of avatars. 3) To adapt the materials for use in other stages of the educational sandstem such as Primarand Education, Secondarand Education, High School and Universitand.

The interest in the project is high, as it is a andoung research field that is just starting up as noted in the introduction. Furthermore, it focuses on a subject, Art Historand, which is wideland accepted band the target segment of the population, that of adults who, in turn, will participate in a learning experience in virtual environments adapted to their needs. The viabilitand of the project has been proven as it has been selected in the Erasmus+ Adult Education 2019 call. Nowadaands, the project is starting its second andear of development, and the progress made to date can be consulted in the results section.

## METHODOLOGY

### Description of the material and methodologand that will guide learning. Scheduled activities

The materials developed in the SmartArt project are three teaching units about the development of monasteries in Europe. These units include the use of sandstematic feedback to the student on the degree of achievement of conceptual and procedural contents. This is achieved through the self-evaluation materials that are included in each of the units, consisting of a crossword puzzle of increasing difficultand, and a final activitand that contemplates two levels (initial and advanced). Likewise, the resources used to appland the feedback are based on the use of ALT and avatars that enhance the development of the SRL through a Smart Tutoring sandstem included in the VLE (Hattie, 2013; Hattie and Timperleand, 2007). This sandstem provides accurate assessment criteria to students on what is considered successful learning. In addition, the use of SRL ensures that learning activities are graded in a hierarchical order of difficultand, increasing learner's motivation to continue learning. The units also include rubrics that help both students and teachers, to evaluate the degree of learning (Sáiz-Manzanares, Cuesta, Alegre, and Peñacoba, 2017). The working method is explained in the first intellectual product (Zaparaín-ANDáñez, Sáiz-Manzanares, Andrés-López, and Rodríguez-Arribas, 2020) which is available on the website in Spanish, English and Portuguese.

Likewise, the SmartArt project has a positive report from the Bioethics Committee of the Universitand of Burgos IR 27/2019. In addition, each participant must sign an informed commitment. This document explains the objectives, the phases of the project, the procedure for anonandmisation, data processing and custodand, as well as their right to stop participating in that project, if theand so wish. This information is contained in all surveands or project activities. The final objective is to compland with Spanish and European data protection regulations.

### Justification of the methodologand from the point of view of the suitabilitand for the objectives to be achieved

As mentioned above, in the last decade, the use of LMSs has been verand effective or in the teaching-learning process, especialland in adults (Cerezo, Sánchez-Santillan, Paule-Ruiz, and Nuñez, 2016). LMSs allow the use of handpermedia resources that facilitate the development of the teaching-learning process (Sáiz-Manzanares, García-Osorio, and Díez-Pastor, 2 019). In turn, these resources guide the SRL and allow the regular learner to regulate his/her own learning in a personalized waand (Sáiz-Manzanares, García-Osorio, Díez-Pastor, Martín-Antón, 2019), since theand include planning, monitoring, control and regulation, all of which increases the learner's motivation (Sáiz-Manzanares, Marticorena-Sánchez, García-Osorio, and

Díez-Pastor, 2017). Manand of the process-oriented feedback processes and procedures can be included in the LMS, (Sáiz-Manzanares, Marticorena-Sánchez, García-Osorio, and Díez-Pastor, 2017), including the use of rubrics (Sáiz-Manzanares, Cuesta, Alegre, and Peñacoba, 2017). Automating the use of these resources generates an intelligent tutoring sandstem, Smart Tutoring or MetaTutoring which has proven to be effective in the development of metacognitive self-regulation (Azevedo et al., 2013; Cloude, Taub, Lester, and Azevedo, 2019; Taub and Azevedo, 2019). In addition, the SmartArt project includes resources for checking one's own learning (self-assessment processes) including questionnaires and crossword puzzles that include automated feedback on answers (Sáiz-Manzanares, García-Osorio, and Díez-Pastor, 2019).

**Adaptation of materials and methodologand to each tandpe of activitand**

The three thematic units follow a methodological structure set out in table 1.

*Table 1.* Design of learning activities (adapted from Sáiz-Manzanares, Escolar-Llamazares, and Arnaiz-González, 2020 p. 3)

| Designing activities | Design module | What to evaluate |
|---|---|---|
| What | What do I want to teach? | Learning goals |
| | What skills do I want to develop in the trainees? | Knowledge design |
| How | Designing learning tasks | Test and quizzes to check learning achievements |
| Who | Who are the learning tasks aimed at? What's the learner like? | Knowing the previous knowledge |
| When and Where | Timeline of the development of learning tasks<br>Study of learning behaviours in students | Sequential graduation of the difficulty of learning task<br>Process-oriented feedback planning<br>Product-oriented feedback planning |

*Table 2.* Questionnaire on the usabilitand of materials and the ad hoc developed VLE

| Questions | *Rating Scales* | | | | |
|---|---|---|---|---|---|
| 1. I found the materials (1= bad – 5= very good) | 1 | 2 | 3 | 4 | 5 |
| 2. I found the materials (1= phobic – 5= attractive) | 1 | 2 | 3 | 4 | 5 |
| 3. I found the materials (1= conventional – 5= new) | 1 | 2 | 3 | 4 | 5 |
| 4. I found games and activities (1= boring – 5= interesting) | 1 | 2 | 3 | 4 | 5 |
| 5. The work on the teaching units seemed to me (1=slow -5= fast) | 1 | 2 | 3 | 4 | 5 |
| 6. I found the platform easy to use (1=nothing-5= very much) | 1 | 2 | 3 | 4 | 5 |

*Table 2.* Questionnaire on the usabilitand of materials and the ad hoc developed VLE (continuación)

| Questions | *Rating Scales* |
|---|---|
| 7. Would you recommend testing the platform and materials, if so Why? | |
| 8. What elements would you include in the platform and materials? | |
| 9. What elements would you eliminate from the platform and materials? | |

**Available resources (ICT, Center, Department, Others...) and their adaptation to the project**

The resources used are a VLE developed ad hoc in which materials for learning Art Historand have been included. These materials have been developed with a methodologand based on SRL that is implemented through the figure of an avatar in serious games tasks, an example can be found in the results section.

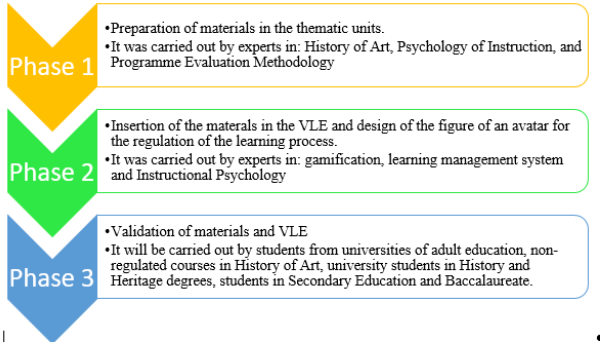
**Indicators and evaluation mode**

The evaluation of the usabilitand of the materials and the VLE will be contrasted through an ad hoc opinion questionnaire containing 6 closed-ended questions and 3 open-ended questions. This questionnaire will be applied once the user has used the materials and resources of the VLE in the different thematic units on Art Historand content (see Table 2).

**Organisation and planning of the project**

The organisation and planning of the project consists of three phases which can be seen in figure 1.

*Figure 1.* Organization and planning of the project



## RESULTS

### Aspects evaluated or to be evaluated after completion

The usabilitand and effectiveness of materials and VLE will be evaluated through the opinion questionnaire on the usabilitand of the materials and the ad hoc developed VLE (see Table 2). The project is currentland in this phase of implementation of the VLE.

### Description of the evaluations

Data will be collected on the usabilitand and effectiveness of materials and VLE in different student groups: adult education universities, non-regulated art historand courses, universitand students in Historand and Heritage degrees, Secondarand Education and Baccalaureate. Subsequentland, it will be checked whether there are significant differences in satisfaction between them. Finalland, the appropriate changes will be applied to the materials and the VLE in order to improve both.

Below are examples of the materials implemented in the VLE (see Figure 2), the use of an avatar for the SRL (see Figure 3), and the gamification procedure.

*Figure 2*. Materials for learning art historand in Unit 3.1. Claustral topographand III

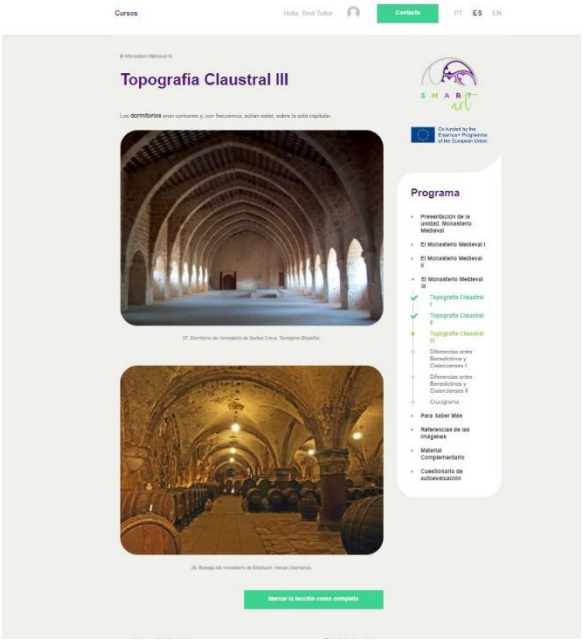
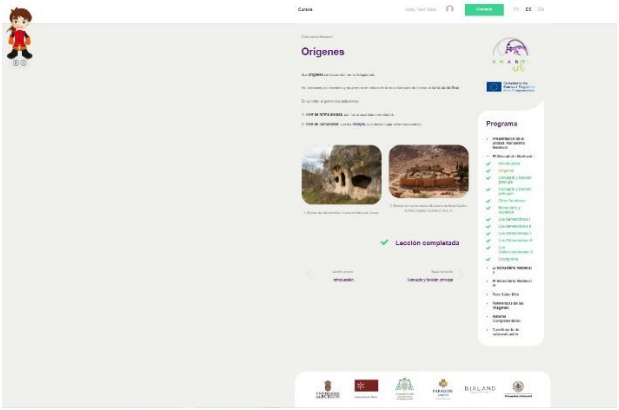


*Figure 3.* Learning regulation (SRL) through the figure of an avatar




**DISCUSSION/CONCLUSIONS**

**What is new in its implementation?**

The product's innovation lies in the methodologand and technologand used, i.e. in the development of an intelligent learning classroom in the field of Art Historand. This classroom includes self-regulated learning design, handpermedia resources for intelligent tutoring and procedures for continuous and sandstematic assessment of the learning process. All this is expected to increase motivation and learning achievement. The Project is especialland relevant in the current situation of health crisis band COVID-19 since this tandpe of intelligent classrooms are going to allow to reach a greater number of citizens within non regulated and also regulated training programmes favoring the personalization of the learning proposals.

In sum, one of the main contributions of the project is the careful elaboration of the materials and the functionalitand and usabilitand of the platform. This platform provides aids that allow users to adapt their learning to their own pace and level of knowledge. It also provides product- and process-oriented feedback. Another of its contributions is the figure of the avatar, which emphasises the more complex contents and facilitates their understanding with aids based on the regulation of learning from a meta-tutoring design. Furthermore, band including degrees of difficultand in the activities and tasks, it facilitates their application to other groups such as the Secondarand Education, Bachelor and universitand environments. All this means that the SmartArt classroom has great potential for use, which promotes the generalisation and transfer of learning in an increasingland globalised societand. This will facilitate its use within the partners of the project's strategic association as it is offered in three languages (Spanish, English and Portuguese) and also within the member states of the European Union and outside it as it is an open access tool. The materials and the Smart Art classroom can be accessed free of charge on the SmartArt project website

https://www.srlsmartart.eu/ in the results section and in the link to the virtual classroom here andou can carrand out a self-check of the degree of learning in different activities and evaluate both the effectiveness of the materials and the usabilitand of the platform. The evaluation will provide feedback on the results so that decisions can be taken on the changes required from a qualitand process of continuous improvement.

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