

# Education in the Knowledge Society Doctoral Consortium

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## ABSTRACT

The Doctoral Consortium track is linked with the Education in the Knowledge Society PhD Programme at the University of Salamanca since the first edition. This track is not closed to PhD students from this programme, but also it is open for PhD candidates from other Programmes that develop their researchers in Knowledge Society related topics. The main aim of the Doctoral Consortium is to provide a discussion space for PhD candidates in which they can share their research progress and receive feedback from senior researchers of the scientific committee. Moreover, this track fosters the relationships between the students in order to establish synergies between them.

## CCS Concepts

• Applied computing~Education.

## Keywords

Knowledge society; technology; education; PhD programme; doctoral consortium.

## 1. INTRODUCTION

The four editions of TEEM Conference [1; 5; 7] have had a strong link with the Education in the Knowledge Society PhD Programme at the University of Salamanca (Spain) (<https://knowledgesociety.usal.es>) [2; 3; 6; 10].

Since the first edition of the Doctoral Consortium [4; 8; 9] the main goal has been focused on providing a space for fostering the communication between the students and the highly valuable international researchers involved in the TEEM Community in order to share their research advances and receive an invaluable feedback about it.

The Fourth edition of the Doctoral Consortium provides an opportunity for PhD students to explore and develop their research interests in an interdisciplinary context, under the guidance of a senior researchers' panel. The students present their dissertation work following the track format guidelines in order to have a clear description of the progress of their researches. They can benefit from the feedback provided by other students in a similar situation as well as senior researchers in the field. The strongest candidates are those who have a clear topic and research approach, and have made some progress.

In this context, the Doctoral Consortium has four goals:

- Provide a space for feedback on student's current research and guidance on future research directions.
- Offer each student comments and fresh perspective on their work from researchers and students outside their own institution.
- Promote the development of a supportive community of scholars and a spirit of collaborative research.
- Contribute to the TEEM goals through interaction with other researchers and conference events.

Regarding the topics of the Doctoral Consortium, these match with the main research lines of the Education in the Knowledge Society PhD Programme:

- Education Assessment and Orientation.
- Human-Computer Interaction.
- Interaction and eLearning.
- Computers in Education.
- Communication Media and Education.
- Medicine and Education.
- Robotics in Education.
- Engineering and Education.
- Information Society and Education.

The topics or research lines are the central axis to organize the presentations of the students' works. The session is divided in two parts. First, each student has ten minutes to present his/her work and later he/she receives feedback from the senior researchers.

The second part of the Doctoral Consortium is focused on establishing synergies between the students who develop their work in the same research line. At the beginning of this part, one student from each research line presents a brief description of the thesis associated with the line. Later, there are panel discussions for each research line with a moderator from the scientific committee.

The paper has been divided into two sections. The first section presents briefly the Education in the Knowledge Society PhD Programme. The second section presents the papers that compose this track of the Fourth edition of TEEM Conference.

## 2. EDUCATION IN THE KNOWLEDGE SOCIETY PHD PROGRAMME

The PhD Programme on Education in the Knowledge Society arises within the Research Institute for Educational Sciences (IUCE – <http://iuce.usal.es>) at the University of Salamanca (Spain), following the Spanish Royal Decree 99/2011. The main aim of this PhD Programme is highlight the teaching-learning processes as driving force of the Knowledge Society, in order to discuss and generate new knowledge about the learning as a key element of the Knowledge Society, including both the Social Sciences studies and the new technological advances but within a synergic and symbiotic approach [3].

The focus of this program is fully interdisciplinary, supported mainly by the Recognized Research Groups at the University of Salamanca: GRIAL (<http://grial.usal.es>) [11], GITE (<http://gite213.usal.es>), OCA (<http://campus.usal.es/~oca/>), VISUALMED (<http://visualmed.usal.es>), Robotics and Society Group (<http://gro.usal.es>) y E-LECTRA (<http://electra.usal.es>).

The PhD Programme provides an environment where knowledge creation and its visibility and dissemination are main goals. In order to reach them, the scientific knowledge management of the Programme is supported by a technological ecosystem that combines technology and methodology to provide tools both PhD students and researchers. The main components of the ecosystem are the PhD portal (<http://knowledgesociety.usal.es>) and a set of social tools such as SlideShare to share presentations (<http://www.slideshare.net/knowledgesociety>) or a Youtube channel to share seminars and conferences (<http://youtube.com/knowledgesocietyphd>).

## 3. TRACK ORGANIZATION

This section describes the twenty-one contributions accepted to participate in this Doctoral Consortium grouped by the main research line to which they belong.

### 3.1 Information Society and Education

#### 3.1.1 *National Repository of Academic, Scientific, Technological and Innovation Information (CTI.MX)/México. An Analysis on the Beta Version Implementation*

This paper is part of the case study that evaluates the implementation process of the Mexican government's policy of Open Access, Access to the Scientific, Technological and of Innovation Information and of the National Repository, promulgated on May 2014. The aim of this work is presented the preliminary observations that are result of a first assessment stage of the implementation of the Beta version of the National Repository of Academic, Scientific, Technological and Innovation Information (CTI.MX) Mexico. This first analysis is based on empirical observation, on the user's experience and on a preliminary contrast with both the guidelines and standards adopted as international common practice, as well as with the guidelines issued by CONACyT (Mexico's National Council of Science and Technology), since it is the federal government's office in charge of the creation, operation and development of the CTI.MX.

#### 3.1.2 *Creating quality standards for scientific content in digital environments through the development of a utility model*

Currently there is a problem when assessing monographs: lack of method and clear indicators to measure the prestige and quality of the publishers and their works. There are precedents that attempt to solve these deficiencies, but they have biases. Research groups such as E-LECTRA or EPUC, other entities (REBIUN, UNE, FECYT or ANECA) and PhD programs (Education in the Knowledge Society at the University of Salamanca), have revealed the nature of this problem that affects negatively on the perception that people have of researchers and institutions. On the other hand, to generate any evaluation system in the current landscape of scientific publishing, the technical needs of both publishers and resources must be taken into account by specific criteria and indicators and, as far as possible, trying to generate a multifunctional tool for all kinds of scientific publication. This paper tackles the steps to define quality standards for scientific content in digital environments through the development of a utility model.

#### 3.1.3 *Open access to educational resources in energy and sustainability: Usability evaluation prototype for repositories*

The purpose of this paper is to show a PhD dissertation research plan, which aims to assess whether the users' experience of users to perform various tasks in an open access repository, increases by integrating Discovery Tools. The tasks to perform by the users are management and information design, dissemination and searches of open educational resources (OER) of sustainability energy. This research aims to develop a usability evaluation prototype, which will offer new insights in the design of the information architecture. In the first stage, the criteria will be selected to measure the level of usability of the tasks to evaluate and develop the analysis of the current interactive design of the web repository. In the second stage, will consist of measure, once implemented the Discovery Tools in the web repository and check the usability level increase in relation with the criteria. The results will contribute for detect new criteria and parameters for provide flexible interfaces, specifically for the web repositories, which are a part of the technological ecosystem of the scientific activity.

### 3.2 Interaction and eLearning

#### 3.2.1 *Designing a model to estimate the impact and cost effectiveness of online learning platforms*

There are different methodologies that have attempted to measure profitability and impact of using online learning platforms, all of which focus on a set of quantifiable and non-quantifiable aspects. These methods consider different items from various perspectives. The purpose of this work is to assess each one and determine the suitable indicators applicable to the reality of higher education in Ecuador. A hybrid model with characteristics from different perspectives could be designed with these indicators.

### *3.2.2 Personal social network as a facilitating tool for collaborative knowledge construction*

The purpose of the study is to analyse the interactions of students in social networks when running collaborative work with the intention of proposing an instructional model that allows determining when interpersonal interactions provide added value in collaborative knowledge construction.

### *3.2.3 Websites of learning support in Primary and High School in Portugal: a performance and usability study*

This study aims to evaluate the quality of educational websites focused on learning support of two degrees of education, Primary School and the High school. To develop this analysis was used a Model of Evaluation of the Quality of Educational Websites (EQEWS). This model of evaluation applied to 57 websites, according to the Likert scale of 0 to 4. This exploratory study concluded that educational websites that had better ranking with higher average values were affected by High School sites. The authors conclude that the creators of these resources are not conscience of the importance to assess their resources from heuristics evaluation, even before putting them on the Internet. It was noted the failure of the functional and technical requirements for who conceives, publishes and maintains their content online, often for lack of knowledge in handling these new technologies.

## **3.3 Computers in Education**

### *3.3.1 Challenge-based gamification as a teaching' Open Educational Innovation strategy in the energy sustainability area*

The purpose of this paper is to show a PhD dissertation research plan about the use of gamification to promote Challenge-Based Learning through online teaching (MOOCs). The aim of the research is to assess the impact of gamification and challenge-based learning in four massive open courses of the energy sector, and the innovation levels reached by the participants. This will be done in order to solve the problems associated with the self-sustainable energy options and propose a model of challenge-based gamification that promotes open innovation in MOOCs.

### *3.3.2 Open innovation laboratories for social modelling sustainable society sensitive to social needs*

This research is framed in the field of citizens laboratories, especially those who are driven by private institutions of higher education. The variables are going to study the interaction of participants of the laboratories, the use of technology and how to participate in a working group when different disciplines are integrated. The main objective is to analyze how the collaborative knowledge construction is achieved when you have a common problem or social impact. This project seeks to know in depth the mechanisms of collaborative knowledge construction.

### *3.3.3 Personalized contents based in cognitive level of student's computational thinking for learning basic competencies of programming using an environment b-learning*

The main objective of the research is to determine the efficiency of using an environment b-learning in the acquisition of basic skills of programming though customizing the content for each student, to achieve a set of activities that can be used will be designed in the Moodle platform and contribute to teaching an initial programming course, considering three skill levels (basic, intermediate and advanced) of computational thinking of students. A mixed methodology approach will be implemented to achieve the objectives. The main result is to generate personalized education, a learning experience that contributes to student motivation in tune with the academic goals of initial programming courses.

### *3.3.4 Video games in teacher training: design, implementation and assessment of an educational proposal*

The aim of this work is an overview of the doctoral thesis called "Video games in teacher training: design, implementation and evaluation of an educational proposal". The main objectives of the thesis are the following ones: to know and to analyse the primary school teachers' (in service) attitudes and the future primary school teachers' (at initial training) attitudes towards collaborative learning with video games; to design, implement and assess an educational proposal about collaborative learning with video games for the future primary school teachers (at initial training), including the use of video games and the creation of video games with software that is not necessary to have previous programming knowledge.

### *3.3.5 A technology-based approach to revitalise indigenous languages and cultures in online environments*

In this paper, the authors show some facts showing the serious problems in the implementation of Intercultural Bilingual Education in the province of Chaco. The data provided here show that this education modality does not fulfill the expectations promised by the provincial or national governments. As a result indigenous languages and cultures in the province keep fading away under the pressure of the Spanish language, different religious denominations and other non-indigenous influences.

## **3.4 Education Assessment and Orientation**

### *3.4.1 Multilevel models for the assessment of school effectiveness using PISA scores*

The concept of school effectiveness puts the data on student assessment into perspective by taking into consideration context factors such as the socio-economic level of the students, resulting in a more equitable way of assessing school achievement. Therefore, the study of factors that can foster or hinder school effectiveness is an important field of study that can help improve the quality of our education system. The doctoral thesis aims to study these factors in the context of the region of Castile and Leon, Spain, by using data from the 2015 PISA (Programme for International Student Assessment) report. This paper provides an overview of the PhD dissertation research plan.

### *3.4.2 Mediation practices for learning in MOOC courses to promote open innovation*

With the increase of the training offered in online environments over the last decade, one of the key elements in these training events is mediation as an enabler best results approval and learning achievements. In this context the role of mediation is key, especially when there is no teacher or tutor in contact with the participants. The aim of this research, that is derived from a doctoral program, is to analyse the

practices of mediation in massive open online courses (MOOC) in the areas of energy sustainability and propose a mediation model that considers the open innovation as a key element.

### *3.4.3 Model for Quality Evaluation and Improvement of Higher Distance Education based on Information Technology*

The paper describes a proposed model for assessing the quality of higher distance education based on the technologies of the Information and Communication. Higher education institutions can adopt this model in order to ensure proper use of Information Technologies and Communication in teaching and learning processes, and strategic processes that support the distance education. This research will use models and success stories from other countries as a basis for generating a preliminary model. Furthermore, this research contains initial reports and results as to justify the contribution of it.

### *3.4.4 The construction of teaching practical knowledge in teachers training within the practicum*

The purpose of this paper is to show a PhD research plan about the construction of teaching practical knowledge in teachers training within the practicum. The main objective of this research is to describe how student teachers learn from their own practice by recording your actions on video, viewing and comment on the actions taken during the session in the classroom. Also, check what kinds of pedagogical knowledge emerge under different situations of reflection (individual reflection, reflection peer tutor and reflection).

### *3.4.5 Open innovation and social construction through MOOCs of energy sustainability: contributions from theoretical foundation*

This work analyses social construction practices of learning given through MOOCs as spaces for open and collaborative innovation are. Through theoretical foundation and from an exploratory approach, the main variables related to the social construction of learning in massive open online courses and different propositions about the direction and intensity of such relationships are established. The results derived in which variables are communication and interaction. The results ensure that there is a need to propose a new organizational method for the evaluation of social learning. This study may lead to future research to strengthen practices for the social construction of learning in massive open online courses, and it may also help to propose new activities that promote social learning or determine what activities can increase the likelihood of success in the social construction of learning.

## **3.5 Communication Media and Education**

### *3.5.1 The Narrative and Media Literacy as influential factors in the efficacy of programs for the prevention of teenage pregnancy*

Unwanted pregnancy in Ecuador is a public health problem. Studies have shown that various psychosocial factors affect risky sexual behaviour. Lack of information and poor access to sexual and reproductive healthcare service, an early start to sexual activity, impulsivity, and perceived invulnerability, among others. The aim of this study is to determine if the level of media literacy mitigates the impact of two videos, narrative and non-narrative, how that impacts their attitude, knowledge, and intentional behaviour to prevent unwanted pregnancy, and the perceived vulnerability, counter-argumentation will also be considered, transport and identification with characters as variable mitigating factors. Experimental research will be applied to adolescent women. The results are intended to be used to show the efficacy of the messages in pregnancy prevention videos are key to be considered in healthcare campaigns for sexual and reproductive health in adolescents.

### *3.5.2 Impact of the narrative formats on the behavior improvement in relation to the socially stigmatized groups: the effect of empathy and similarity in terms of social identity*

The aim of this paper is to study the effect of narrative formats on the reduction of negative prejudices and worldviews in regard to the different socially stigmatized groups (as a collective of immigrants). Two experiments that analyse the impact of the effect of narrations on the behaviour in regard to the stigmatized groups will be conducted, paying particular attention to the empathy role, identification with the characters and the similarity in terms of social identity.

## **3.6 Medicine and education**

### *3.6.1 Artificial Neural Networks applications in Computer Aided Diagnosis. System design and use as an educational tool*

This paper describes the motivation, state-of-the-art, hypotheses and research objectives of a doctoral thesis focused on Computer Aided Diagnosis and Detection (CAD), a valuable automated tool for specialists who interpret medical images, that provides information which can be used as a “second opinion” or supplementary data in their decision making process. Developing CAD schemes based in the machine learning models called Artificial Neural Networks (ANNs), which could be applied to different image modalities, is the main objective of the first phase of the dissertation. Their integration in a software environment that allows the user to handle and access to information efficiently is of key importance in the process. The validation of the system in clinical practice and the investigation of their possible uses as an educational tool for trainees during residency programs is the second phase.

## **3.7 Engineering and Education**

### *3.7.1 Proposal of a Framework of IT Governance for Public Universities in Ecuador*

This paper describes the utility of a framework of corporative Information Technology (IT) Governance and how a specific, simpler, progressive and scalable model can be a reference and used in the Ecuadorian public universities. The purpose is ensuring the correct use of the IT, generating business value. The main objective is converting the IT in an corporate strategic element, so that it can serve as a support for the corporate managers, allowing them execute actions and optimal decisions, targeted to the effective use of the IT.

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