

## **A Spanish proposal for teaching Informatics in pre-university studies**

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Recently, the Spanish Computer Science Scientific Association (SCIE - *Sociedad Científica Informática de España*) and the Conference of Directors of Informatics Faculties (CODDII - *Conferencia de Directores y Decanos de Ingeniería Informática*) have published a report devoted to express the social need to include the Informatics discipline in all the levels of pre-university studies (Velázquez Iturbide et al., 2018) following a European (Balanskat & Engelhardt, 2015; The Committee on European Computing Education (CECE), Informatics Europe, & ACM Europe, 2017) and worldwide trend (Grover & Pea, 2013) and taking the UK model (Berry, 2013; Kemp, 2014) and the Israel model (Gal-Ezer, 1995) as inspiring sources.

Digital competence is a key competence proposed by the European Union. Having basic computer skills is a necessity in today's society, which adds to other basic knowledge, such as reading, writing or performing arithmetic operations (García-Peñalvo, Llorens Largo, Molero Prieto, & Vendrell Vidal, 2017; Llorens Largo, García-Peñalvo, Molero Prieto, & Vendrell Vidal, 2017; Llorens-Largo, 2015).

The development of any key non-transversal competence requires independent subjects with a mandatory character, such as Mathematics, Physics, Chemistry or Natural Sciences, for example.

Informatics constitutes a mixed discipline with elements of science and technology. Therefore, its learning requires an independent subject from others with which it has a relationship but whose contents are different, such as Mathematics or Technology.

The contents of digital competence and informatics must vary according to the educational level and the corresponding degree of maturity of the students. Specifically, primary education must include contents of digital competence and basic knowledge of programming, computers, networks and data. Digital competence must ensure basic knowledge and skills for the efficient, safe and ethical use of information technologies. Secondary education is similar, but the knowledge, with a special emphasis in programming, must acquire a more abstract character. The competition digital will be developed at an average user level. Finally, the High School Diploma should make a distinction between the modalities of Sciences, Sciences Social and Humanities, and Arts. In all cases, it will be deepened in knowledge of informatics and the application of tools will be highlighted computer tools in each specific field.

From JITR, we have supported the computational thinking development (García-Peñalvo, 2016b), with a special attention in pre-university levels (García-Peñalvo, 2017; García-Peñalvo & Cruz-Benito, 2016; García-Peñalvo & Mendes, 2018) and informatics education, specially oriented to programming education (García-Peñalvo, 2016a; García-Peñalvo, Reimann, Tuul, Rees, & Jormanainen, 2016). Moreover, we encourage to advance in Spain and in other countries to introduce Informatics Education in all pre-university educational levels as an independent subject.

This JITR issue is comprises ten research papers.

Tóth and Hosszú, in their paper entitled “A New Topological Method for Examining Historical Inscriptions”, present a new method developed to increase the efficiency of the identification algorithm for historical inscriptions of unknown origin. Authors extract topological properties of the symbols containing different script relics and analysed them by using statistical tools.

The paper “Feature based Approach for Detection of Smishing Messages in the Mobile Environment”, by Jain and Gupta, presents a new feature-based approach to detect smishing messages in the mobile environment. This approach offers ten novel features that distinguish the fake messages with the ham messages.

Lekehaliand and Moussaoui, in their paper entitled “Quantum local binary pattern for medical edge detection”, introduce two applications that use procedure called Quantum Local Binary Pattern (QuLBP) to detect edges in magnetic resonance images.

In the paper “Generative matching between heterogeneous meta-model’ systems based on hybrid heuristic”, Batouta et al. propose a hybrid heuristic allowing the connection between meta-models of different systems, this will allow the generation between models conforming to these connected meta-models.

Santos et al. make a study to evaluate four educational sites directed to High School through the implementation of an assessing EQEWS Model, in their entitled paper “Evaluation of High School Websites Based on Users: A Perspective of Usability and Performance Study”. The Evaluating Quality Model is based on ten criteria, according to a Likert scale of 0 to 4. The results gave rise to a Quality Ranking with the averages of the two best and the two worst sites. These four sites were evaluated by two hundred users who answered a questionnaire applied through of agree, disagree and undefined scale. They evaluated the performance and degree of satisfaction while consulting the websites. The results showed that usability and navigation were the first and second criteria to be preferred by the users'. Majority of the users were satisfied with the usability and the navigation but dissatisfied with the criteria of update and communication of the websites they evaluated.

In the paper “A context-aware approach for generating user interfaces based on usability requirements”, Zaibi et al. propose a methodology that considers the human factors while designing user interfaces. Particularly, the approach focuses on how to

select consistent usability requirements and how to incorporate them into user interface development process considering the context of use.

The paper “New Evolutionary Adoption Model for Innovation Diffusion”, by Chikouche et al., present an original model that simulates the adoption decision as a process of gradual acceptance and focuses on the representation of (1) the innovation features (2) the individuals’ heterogeneity, (3) the social network (4) the communication influence.

Othman and Jemni, in their paper “Designing High Accuracy Statistical Machine Translation for Sign Language Using Parallel Corpus — Case study English and American Sign Language”, deal with the machine translation of written English text to sign language. The work proposes a novel approach aiming to build artificial corpus using grammatical dependencies rules owing to the lack of resources for Sign Language. The parallel corpus was the input of the statistical machine translation, which was used for creating statistical memory translation based on IBM alignment algorithms. These algorithms were enhanced and optimized by integrating the Jaro–Winkler distances in order to decrease training process

The paper “Mining Associations between Collaborative Skills and Group Roles in Collaborative E-learning Environments”, by Costaguta et al., explores relations between collaborative skills and group roles by means of the application of association rules over a dataset of university students’ interactions during Computer-Supported Collaborative Learning sessions. The discovered knowledge might be used for automatic recognition of student roles based on collaborative skills that students manifest in their groups. Furthermore, the discovered association rules could be used for forming groups with a balanced combination of roles.

Finally, in the last paper, entitled “Design of a Novel Query System for Social Network”, Virmani et al. propose a Query Processing and Analysing System (QPAS) for Social Networks, which is based on extracting user’s intent from various social networks using existing Natural Language Processing techniques.

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