Book Review

ICTs in Higher Education:
Ubiquity, Mobility, and Connectivity

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María Luisa Sevillano García and Esteban Vázquez Cano (2015). **Modelos de investigación en contextos ubicuos y móviles en educación superior.** Madrid, Spain: McGraw-Hill, UNED, 330 pages.

This book is one of the products of Project EDU2010 17420 (EDUC Subprogram), entitled «Aprendizaje ubicuo con dispositivos móviles: elaboración y desarrollo de un mapa de competencias en educación superior» [Ubiquitous Learning with Mobile Devices: Generation and Development of a Competency Map in Higher Education]. This is an initiative associated with the General Department of Research and Management, part of the National R+D+I Plan implemented by Spain's Ministry of Education. Under the coordination of María Luisa Sevillano García and Esteban Vázquez Cano, the book is divided into six chapters that provide a thorough analysis of the research on teaching in diverse spaces which are independent from the traditional context of university education.

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The book, unlike dissemination works on these resources, is rich because it reflects an intense investigative approach, marked by a meticulous and scientific way of addressing the research objectives proposed. In addition, it is the product of a mixed model that combines abstract theory with descriptive praxis in certain cases. It also develops a theoretical framework based on the educational context of de-localized university education, supported by an applied, concrete experience. An important part of the book is its description of the instruments created for collecting data in a precise, objective, true, and repeatable manner. This is due to the fact that, often, there are no standardized tests for measuring these very dynamic educational realities. Therefore, it becomes necessary to make adaptations or create new instruments for observing and quantifying the object of analysis. In fact, the creation of such instruments tends to be costly and requires a precise analysis of the state of the art, along with an *a posteriori* validation involving several systems: only thus can it be ensured that the tools generated provide rigorous measurements. In other words, this is a book that blends basic and applied research while also taking into account the sociocultural and educational impact of the results obtained.

The present research project was carried out by thirteen academics from five Spanish Universities (UNED, Universidad Complutense de Madrid, Universidad de Oviedo, Universidad de Granada, and Universidad de Vigo), under the coordination of Professor María Luisa Sevillano García. In addition, it involved the collaboration of seven foreign universities, form Europe and South America, which became part of the project and thus imbued the study with an international quality.

The text follows a traditional research structure: it starts with a normative contextualization of the phenomenon and an analysis of mobile digital technologies; afterwards, it presents the methodological design of the research project, addressing it from both a quantitative and a qualitative point of view. The final section presents the results and advances conclusions that connect ubiquitous resources with associated competences.

Within this framework, the text starts by introducing mobile media and their impact on norms and guidelines from an educational perspective. The first chapter enumerates certain fundamental ideas which have become key points of reference for addressing this typology of ICTs and educational resources, taking into account the views of both teachers and students, along with those of educational systems and regulations. This section encourages reflection and debate, given that the perspectives for working with these new tools tend to be very broad and open to experimentation.

Afterwards, the text provides a descriptive look at some of these new technologies and their associated phenomena, such as massive open online courses (MOOC), the new ways of working online linked to interaction in blogs, multimedia inclusion, and other collaborative spaces currently available on mobile devices. In this section, complementarily, the authors review some tools for exploring contents in social networks, the new creative spaces open to students on the Internet, and augmented reality experiences, along with other especially relevant technologies. The chapter ends with a review of the various teams that configure the so-called *digital mobile devices*, that is, smartphones, tablets, and e-books, among others, as well as some of their specific applications (APP).

The third chapter mentions the study of scientific analysis and their explanations, empirical research, the variables involved in a study, and types of statistics. In this regard, it is relevant to highlight the description of the new research methods and models focused on the analytics of learning, big data, data mining, and social network analysis, all of which emerge as additional spheres of the investigative process that are closely linked with these new technologies. The selection of instruments suitable for examining certain given phenomena and the analysis process of the data collected are the sequential phases carried out for measuring the achievement of the objectives set. These phases —which are repeated in every study— are reformulated here within the concrete format of a research project proposal with all its measurement instruments, which are also included in this chapter.

Chapter Four quantifies the use of mobile devices and their rates of network access, specifying the results for each country. An especially illustrative example is the relationship identified between the learning sought and found using these devices, described from a quantitative perspective and supported by a dense and rigorous graphic presentation. In the following chapter, the study performs content analysis with a qualitative approach, initially defining six descriptors: *communication*, *time savings*, *mobility*, *leisure*, *ubiquity*, and *technical applications*. In the same chapter, the authors analyze life stories collected by means

of interviews in order to configure the following macro-categories: *device-related practices*, *competency map*, *methodologies*, and *good practices*. Lastly, the text presents the fundamental results of the discussion group techniques, which closes this qualitative section.

Chapter Six provides a summary of the competencies associated with each mobile device, and several conclusions derived from the results of the study are outlined. Thus, a new map of professions is delineated which grows and engages with the interactive digital world. These professions must be connected with social and work needs in a dynamic fashion, taking into account the new scenarios and time constraints of the working world.

Finally, the text suggests several important changes to be made in the educational environment in order to implement practices that are consistent with mobile and ubiquitous learning: the institutional, spatial, and temporal borders of education must be blurred; the balance and relationships between educational components must be rearranged; differences must be exploited as an enriching element; the variety and combinations of content representation modes must be broadened; conceptualization abilities must be supported by the new tools; and individual thought must be connected with networks and collaborative knowledge. In sum, the new instruments have a major impact on educational interactions, methodologies, assessment systems, and outcomes.

In Chile, in the field of public policy, the year 1997 was marked by the encouragement of research and technology, two fields which have grown due to the strong development of the information and knowledge society. Years later, new information technologies were incorporated into teaching and learning practices, a process that materialized mainly via curricular innovation proposals that universities were required to implement in the early 21st century. In other words, innovation in higher education necessarily entails connections with technology, with learning processes, and with the demands of the working world. Within this context, Sevillano García and Vázquez Cano's book enriches national experiences and contributes to research, to continuing education for teachers, to the diversification of resources for students, and, certainly, to the organization of educational institutions.

To sum up, the studies derived from the initial project display a trajectory that differs from that of Latin American higher education, and especially from that of Chilean higher education. Nevertheless, the requirements for the academic world are shared by the system as a whole: we are dealing with a continuous and explicit technological revolution that transforms the traditional contexts and procedures involved in the acquisition of knowledge. One of the most recurrent manifestations of this reality is the fact that higher education students carry their mobile phones with them most of the time, and this mere state of affairs may provide new opportunities for addressing the tasks of teaching and learning.