

Comparative study on skills needed by organizations and effectively developed in eLearning management courses

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Abstract This paper investigates the skills developed in higher education management courses through an eLearning process. The relevance of this research is based on the approach to theories of skills development, and the main purpose is to identify the skills developed by the students from management courses and compare it to the skills needed by the organizations to be competitive in the market. In this stage of the research, the skills needed by the organizations were identified through a document analysis of prospective studies conducted in industrial sectors developed in the last 15 years. In order to verify whether these skills are developed in the management courses, an online survey was conducted among distance learning University students from 2011 to 2014. The research problem considered the analytical dimension of skills development in organizations anchored to the following research questions: What were the skills identified in the prospective studies? What has been the level of skills developed in courses on management in e-learning mode in higher education? What were the relationships between the perceived skills development and various factors such as gender, employed/unemployed, type of organization and job variables? What are the lessons learnt in order to

propose a theoretical model developing skills in higher education management courses? This study is centred on the research of more relevant work skills which can contribute to organizations' performance and competitiveness in the market.

Keywords Skills · Organizations · Higher education · Management

1 Introduction

The main objective of this study is to identify managerial skills required by the industry in order to check whether students in higher education management courses performed through e-learning modalities perceive that the courses developed those skills properly. The identification and development of the required skills are challenging tasks for both organizations and universities. In the context of this paper, the focus will be in the identification of sets of skills associated with job activities in the management area.

The concept of skills required by organizations has been studied by several authors with a particular emphasis since the 1990s [10, 22, 23, 26]. Skills development prevails as a research issue in the higher education domain because it is the main goal to be achieved by the students. Skills development is perceived as a strategic management tool to cope with the current business environment [27], mainly because the market has changed from one of mass production to one of customization where quality, price, and speed of delivery are stressed. This change has brought about new circumstances in which many organizations struggle to cope: new and emerging customer segments, cultural diversity in a global marketplace, market volatility, raised customer expectations about quality of products and

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services, and the impact of the internet on an organization's core business [20]. In the job market, there has been a growth in higher-level jobs such as managerial and professional positions that require flexibility and problem-solving skills.

These are skills that need to be integrated in the management courses in higher education, and this research tries to analyse if the skills identified by the organizations as fundamental for their competitiveness are being developed by the universities.

When it comes to e-learning as an information system, the theory of information systems continuance [3] is a quite frequently used framework. It posits that continuance intention of a certain information system is dependent on the intertwined relations established between perceived usefulness, post-acceptance perceived usefulness, satisfaction, and confirmation of expectations from prior information system use. Since then, a vast majority of research conducted under this umbrella considers implicitly that the impact of those constructs is equal in intensity and sign among surveyed individuals.

On the other hand, extant research on information technology acceptance has relied heavily on the unified view [35], which was strongly based upon the theory of planned behaviour [1], though needed a relevant adaptation for the case of information technologies. That unified view empirically found and theoretically developed some of the key moderators of acceptance. Essentially, they accounted for dynamic influences including issues such as organizational context, user experience, and demographic characteristics. The latter moderators implied that it was very likely that there were different profiles of users that deserved further research. Follow-up research has found the existence of sources of individual differences in technology acceptance, as for instance the big-five personality traits [30]. This research stream implies that an individual's cognition and perception play a determinant role in the adoption and continuance of technologies that facilitates universal accessibility to higher education: e-learning information systems.

As a first necessary step in the quest for a comprehensive understanding of e-learning adoption and continuance, this study contributes with the identification of another possible source of differences: the work position occupied by students and their different perception of how much the courses develop the skills required by the industry. Firstly, this paper briefly explores the concept of skills, followed by a presentation of the methodology that was used as the basis for the skills identification in the industry. A sample of students taking courses in e-learning modalities within the management field was consulted. The survey investigated their perception of the level of development of these skills in those courses.

2 Literature overview

2.1 Concept of skills

During the 1980s, the concept of skills starts to gain a big importance due to technological, organizational, and economic factors. It begins to be considered as a resource—of individual and organizational nature—which would offer competitiveness and productivity advantages to companies.

The complexity and the uncertainty, partly due to the globalization and accelerated rhythm of technological change, demand human resources with skills that help organizations to overcome the appearing challenges.

In this context, skills are defined as a set of knowledge, capacities of action, and behaviours, structured according to an objective in a specific situation [16].

Meanwhile, as a result of the changes occurred in organizational contexts, other concepts emerged associated with the concept of skills. In this sense, the concept is formed by organizational skills, which are considered as a coordination of a different basis of knowledge (know-how, know-what and know-why) and its application to one (or more) product(s) or process(es) [28].

In the same way, the concept of individual skills has been studied by different authors. The most prominent typology distinguishes the following types of knowledge and capacities in skills [13, 25]:

- *theoretical knowledge*, integrating the concepts, the subject knowledge, the organizational and rational knowledge and also the technical knowledge about the context and processes, operational methods and means;
- *know-how*, related to the ability to execute operations and use instruments and apply methods and procedures. This know-how has an operational character, of practical application or operationalization of theoretical knowledge;
- *social and relational know-how*, related to attitudes and personal qualities and to the predisposition to act and interact with others, i.e., the ability to co-operate with others;
- *cognitive capacities*, related to intellectual operations, that can be simpler (enumerate, compare, define, describe) or more complex (inductive generalization, constructive generalization, analogical reasoning, abstract reasoning). They describe capacities of combining different knowledge, of coordinating actions so that solutions are found and problems are solved.

Historically, the word *skills* have been used to refer to individual characteristics. Although the basic concept is referred to the individual [29], all skills have two dimensions, the individual and the collective ones (organizational).

In this way, the concept of skills assumes a rather large scope which makes it complex and further makes its comprehension/understanding and concept delimitation difficult.

2.2 Skills models

Further clarification of the concept of skills was developed by including the organizational characteristics and also the individual characteristics [14], as explained in the following.

2.2.1 Organizational characteristics

The organizational characteristics reflect the identity of the organization in which the mission, the values, and its own culture are inserted. This holds the core skills and capacities that are reflected in the mission and the vision of the organization, beyond the values and core priorities reflected on the shared working habits and the handbooks of conduct and ethics.

The *core skills* are the strategic skills, which make an organization unique and distinctive. They can be, for instance, technical knowledge or a specific technology which can offer a unique value to the customers and that distinguishes the enterprise from the rivals. They are the basis for the organization to develop beyond its final products.

A core competence is the technical know-how, which is of the outmost importance for the objectives of the organization. They are a source of competitive advantage which is the result of the value acknowledged by the customers, and it is difficult to imitate.

The core capacities are also very important for the effectiveness of the organization and are easily understood by the customers—they are a set of business processes strategically understood [18].

The *values and priorities* of the organization aim to create a sense of community, which can lead to an increase in trust and commitment by the workers.

They complement the technical aspects of the work and explain the reason why the work is accomplished. They imply the sharing of beliefs and cultures, including behavioural rules.

The priorities reflect the effort of the organization to use individual skills, such as working habits, people's knowledge to fulfil the business and to make the working systems function in a more efficient and effective way.

An important priority of the enterprise is its will to promote the participation of the workers, in order to develop its performance [17].

2.2.2 Individual characteristics

Individual characteristics change his/her performance because they reflect themselves in the content of his/her work.

In what regards individual characteristics, we may identify technical knowledge/specific skills of the job and the social relational skills.

2.2.3 Technical knowledge/specific skills of the job

This type of knowledge is learnt in formal learning situations and differs according to the specificity of the job and the sectors of activity. It is the basis of the core of strategic skills of organizations.

2.2.4 Relational and social skills

These skills include working habits, communication styles, leadership forms, and teamwork. They are skills easily transmissible between jobs and even sectors of activity. However, they vary from organization to organization, according to the importance that each organization gives to certain skills or to the leadership/management styles adopted.

The social and relational (or behavioural) skills are not only used/developed in the execution of job related tasks, but are also the support to the core values and priorities of the organization.

Both the individual and the organizational characteristics have a strategic dimension and contribute to the creation of value, generating advantages acknowledged by the customer: fastness of response, precise demands of quality, after-sales service. We are therefore speaking about strategic skills.

In the same line of thinking, three criteria are concerned relative to critical skills, namely strategy, competitiveness, and specificity or rarity [13]:

- strategy takes into account the indispensable skills to the strategic orientations of the organizations;
- competitiveness allows to identify the necessary skills to acquire or keep a competitive advantage in a domain of activity;
- specificity has to do with the specific characteristics of the enterprise and that are not found in the working market.

Despite the inherent duality of the skills nature (ability and talent), in recent analyses, they are considered a set of

individual and/or group knowledge that allows to generate orientation to ensure organizational sustainability and competitiveness.

2.3 Contexts influencing skills development

In recent years, organizations have faced an increasing competition, budgetary constraints, and a major technological change. To face these changes, many have developed practices, policies, and processes that offer additional value to the customers, reflected for instance in the improvement of service quality, reduction of the costs, or greater speed in the product delivery/service accomplishment.

Influenced by these changes, organizations have been suffering structural changes implying the need to develop new skills. Different empirical studies have revealed that the organizational instruments lead to changes in the structures of organizations. Work organization, mainly structured by multiple functional levels, has tended to change into a horizontal model, where all the workers play a key role in what concerns the decision-making and the organization of their own work.

The same studies confirm that there is a tendency to create of work groups/teams, instead of individual work, emphasizing the need for work coordination instead of a culture of control and centralization of decisions. These changes imply that the elements of the teams need to possess skills, the necessary information autonomy to respond to unpredictable disturbances, resulting from of the technical systems and of the environment.

On the other hand, work begins to be organised in terms of the processes and not of the jobs, implying not only team work but also, and most importantly, responsibility taking by each of the workers for the quality of the developed work and for the achieved goals. These developments require skills at the level of technical knowledge and especially at the level of relational/social knowledge.

Approaches to the anthropocentric model assumed the development of specific structures conceived according to the value of the human factor and new organizational principles such as autonomy, responsibility, creativity, professionalization, decentralization, participation, and co-operation, demanding new technical and social knowledge for each level of qualification [16]:

- superior management staff must have a systemic vision, perform strategic management, understand new methods and management techniques and have the capacity to share information, listen, negotiate, and motivate;
- superior technical staff connected with new technologies must have knowledge of “*hardware*” and/or “*software*”, as well as “*orgware*” and cooperate with

specialists connected with the social system so that the integration of the TI in the organizations is possible;

- for middle management, more planning, greater coordination and less direct control are required. Beyond richer technological knowledge, they must have motivation for training, communication, and co-operation, which presumes higher technical formation in the areas of organization, management, and human relationships;
- operators should be polyvalent, have initiative and responsibility spirit, the capacity of identifying and solving problems, know how to communicate and work in team, having also to achieve quality control.

In that context, an organizational paradigm that appeals to organic flexible structures continuously adaptable to new situations is presented, in opposition to bureaucratic and centralised structures. In this paradigm, the enterprises tend to be innovating and more receptive to changes. They implement new forms of organizing work and present decentralised and participative decision-making, appealing to a greater autonomy and responsibility by their collaborators. However, to achieve an organizational development to this level, an investment must occur in the development the skills of people from the organization.

All these types of skills have in common a focus on performing work activities and can be used by organizations to help systematize their own skills, contributing to the creation of a tool for fundamental work that could provide answers to the challenges posed by the economic and social contexts in which they operate.

2.4 Background of approaches on e-learning management systems

So far, empirical studies on the effectiveness of e-learning courses have shown that no significant differences should exist when one compares well-designed online courses with well-designed in-person learning [6, 21]. However, studies on e-learning implementation success still found that some differences exist in the way students perceive their online experiences [21]. Moreover, the vast majority of extant research on e-learning success has relied heavily on two complementary frameworks, namely the unified view of information technology acceptance model [35] and the theory of information systems continuance [3].

Both of them complement each other in a stepwise view of the process of implementation. A certain technology must first be adopted in order to succeed and, after adoption, it must continue to be used for a certain time. Both frameworks consider the user perception as an influential construct in the successful adoption and continuance of a certain technology. Empirical developments in higher education have included for instance perceived usefulness,

perceived ease of use and perceived enjoyment to explain the technology adoption [e.g. 12], as well as the user's continuance intention of a certain information technology [e.g. 33, 36, 24].

Recent literature reviews on successful implementations of e-learning in higher education have shown a wide variety of critical success factors and metrics [15]. Some have identified eight blocks of factors [9]: educational technology; computing experience; attitude towards the technology; social influence of the technology; the user's CV; language; teaching and learning styles; and the student's demographic characteristics. In narrower contexts, others have classified four such blocks [7]: institutional management; learning environment; institutional design; and course evolution. Yet, empirical evidence has largely emphasized the relevant role of user's perception, including more numerous studies on students [e.g. 4, 11, 34, 2], teachers [e.g. 31], and comparisons among both group of users [e.g. 24].

Moreover, theoretical and empirical studies on e-learning success seem to have paid little attention to a critical component of the teaching–learning process: the extent to which the technology used help to meet the intended learning outcomes. For instance, some empirical models classified the determinant factors in six dimensions [34]: learner; instructor; course; technology; design (in fact, perceived usefulness and easiness of use); and the environment. Within the course dimension, this study included e-learning course flexibility and e-learning course quality. However, whether and how the e-learning system helped to reach the intended learning outcomes was absent among the items included in this dimension. Such issue is also excluded among the empirical research already mentioned.

Another study provides an exception that calls for further research on this forgotten issue across literature [5]. In this paper, the model explicitly included the construct “student's perception of efficacy” in the study of performance of online students. In fact, that construct has not a direct effect on performance, yet motivation played a mediation role. The work experience also has a significant role in that equation. Empirical research has also found individual differences in the perception of e-learning usefulness in terms of personality traits [30].

Therefore, it seems that research should consider a more thorough model of adoption and continuance of e-learning systems. That model should include the perception of how the e-learning system helps meet the intended learning outcomes. The model should also consider more carefully the possible existence of moderators such as the user's e-learning experience [19], or the role of the user's work experience [5]. The existence of moderators is strongly supported by the unified view of technology adoption [35]. Some authors have emphasized that the unified view relies

heavily on expectancy disconfirmation theory [8], which finally implies that meeting the user's expectations is the most influencing factor on e-learning continuance decisions. Among these expectations, e-learners seek an increase in the competencies required by the industry [34], and particularly in the case of managers, they want to improve their managerial skills.

Consequently, the learning outcomes are to be identified by examining the surrounding industry requirements in terms of competencies. It is very likely that individual differences may stem from work experience and position occupied by the student, among many other individual characteristics. They may play a moderating role in user's perception. The identification of this moderation will help implement the required adaptations and skills in order to grant universal access to this type of technologies.

3 Research questions and methods

The following research questions have guided the present study:

- RQ 1 What were the skills identified in the industry studies?
- RQ 2 What has been the level of skills development in the higher education management courses?
- RQ 3 What were the relationships between the perceived skills development and various factors such as gender, employment, type of organization and job variables?
- RQ 4 What are the lessons learnt in order to propose a theoretical model for granting universal access to the skills in higher education management courses through eLearning technologies?

3.1 Methodology

In this study, two sources of data were collected as follows: (1) document analysis and (2) online survey.

The main technique used was content analysis from the document analysis of prospective studies in industry. This methodology was used to analyse the skills identified by the organizations which participated in the study.

The second technique for data collection was an online survey applied to 250 students that resulted in 117 valid questionnaires (46.8 % response rate). The statistical analyses were conducted by means of Cronbach's alpha coefficient, Chi-square Tests, and Mann–Whitney Tests for differences between skills variables and variables comprising characteristics of the surveyed individuals.

In total, the questionnaire consisted of 30 questions with 26 items covering the following areas:

- Students background information (Question 1–4);
- List of skills development during higher education management courses (Question 5–30).

4 Results

4.1 Content analysis

In order to answer the research question (RQ 1) “What were the skills identified in the prospective studies?”, a content analysis was performed from the literature review of prospective studies on organizational innovation skills. This methodology was used to analyse the presence of certain words or concepts within the studies to identify those skills. The search was based on the keywords “skills”, “management”, “leadership”, and “innovation”, and the period considered was 1999–2014.

The skills identified are described in the following [32].

Management

- skills at the level of the definition of business strategies which add value to the offer starting from immaterial factors;
- skills at the level of the definition of internationalization strategies;
- capacity to manage strategic deals and alliances with other enterprises;
- capacity to diversify the business area, identifying new business opportunities, investment analysis, and economic viability studies;
- social and relational skills;
- skills related to the management of people and their development.

Leadership

- skills related to the employees performance development;
- skills associated with the development of new opportunities for the employees through techniques such as coaching and mentoring;
- skills associated with motivation, satisfaction, commitment, and meeting the employees’ expectations in order to potentiate the employees performance;
- skills related to the corporate governance;
- skills associated with the management of the cultural differences among employees.

Innovation

- social and relational skills, due to new forms of work organization: polyvalence, flexibility and flexible forms of work organization, teamwork, or initiative; developing social and relational knowledge which allows the coordination of working teams;

- skills regarding quality management: quality control, quality rules applicable to the sector;
- skills associated with the organization of the working conditions and layout: redrawing of productive layouts, division of work depending upon the individuals and task conditions; skills associated with the implementation of models like JIT, TQM, or CIM;
- skills associated with the analysis of information related to productivity, in what concerns manpower costs, production costs, quality problems in the process and in the product, stock management (raw material, materials or finished products) among others;
- skills related to the adaptation to change (raw materials, materials, technology, products);
- skills associated with the knowledge of the subcontracting market and process;
- skills related to the area of hygiene and security at work.

4.2 Survey analysis

With regards to respondents gender, 64 were male and 53 female (see Table 1),

Most of the respondents were employed ($n = 97$) (see Table 2).

The types of organizations were primarily (see Table 3): education ($n = 18$), public sector ($n = 18$), health and social work ($n = 13$), commercial services ($n = 12$), manufacturing non-food ($n = 16$), Transportation, communication ($n = 11$), Financial services ($n = 14$) and other ($n = 15$).

Respondents characterised their jobs as Top management ($n = 12$), Middle management ($n = 18$), Executive level ($n = 20$), Technical specialist ($n = 21$), and Support staff ($n = 13$) (see Table 4).

Regarding the survey, the respondents were presented with 26 items representing management, leadership and innovation skills. These skills emerged from the content analysis across the extant prospective studies in industry. Table 5 shows the different dimensions of the questionnaire.

The first dimension of the questionnaire integrates the management skills needed by the organizations: Business strategies, Internationalization strategies, Management of strategic deals and alliances, Diversify the business, Social and relational skills, People management, and Communication.

Table 1 Background information on students that participated in the study—gender

	<i>N</i>	%
Male	64	54.7
Female	53	45.2
Total	117	100.0

Table 2 Background information on students that participated in the study—employment

	N	%
Employed	97	82.9
Unemployed	20	17.1
Total	117	100.0

Table 3 Background information on students that participated in the study—type of organization

Type of organization (n = 117)	n = 117#	%
Education	18	15.4
Public sector	18	15.4
Commercial services	12	10.3
Health and social work	13	11.1
Manufacturing non-food	16	13.7
Transportation, communication	11	9.4
Financial services	14	12.0
Other	15	12.8
	117	100.0

Table 4 Background information on students that participated in the study—job position

Job Characteristics of respondents (n = 117)	n	%
Top management	12	10.3
Middle management/line manager	18	15.4
Executive level	30	25.6
Technical specialist/engineer/quality control	21	17.9
Staff/carry out primary work process	12	10.3
Support staff	13	11.1
Other	11	9.4
	117	100.0

The second dimension of the questionnaire integrates the leadership skills: Employee performance, Development opportunities, Motivation of employees, Satisfaction of employee, Corporate governance, Communication, Managing expectations, and integrating cultural differences.

Finally, the third dimension integrates the innovation skills: New forms and models of work organization, New technologies, Organizational change, Initiative, Decision taking and responsibility, Quality management, Hygiene procedures and security at work, Production management, Creativity and Innovation, and New management models.

Respondents were asked to rate the skills on a 5-point Likert scale as follows: 1 = no development; 2 = weak development; 3 = moderate development; 4 = considerable development; and 5 = strong development.

RQ 2: “What was the level of skills development in the higher education management courses?”

According to the perceived skills development, the resulting mean scores varied for management skills between 3.2 and 3.3, for leadership skills between 3.27 and 2.9, and innovation skills between 3.1 and 3.2, as outlined in Table 5. Therefore, all the skills identified by the prospective studies had a moderate development in the higher education management courses.

RQ 3: “What were the relationships between the perceived skills development and various factors such as gender, employment, type of organization and job variables?”

Cronbach’s alpha (α) for all 117 respondents’ management skills items was calculated and a value of 0.87 was obtained, which allows for the creation of a new variable by combining the 7 items. Similar calculations were made for the 10 leadership items and the 9 innovation items to achieve scores of 0.78 and 0.89, respectively.

The differences between various factors of interest and these three new key variables were assessed using Mann–Whitney U Test (gender, employment, organization, type of organization and job). The results showed significant relationships between job position and the three types of perceived skills: management skills development ($X^2 = 170.81$; $df. = 44$; $Sig. = 0.00$); perceived leadership skills development ($X^2 = 177.36$; $df. = 56$; $Sig. = 0.00$); and perceived innovation skills development ($X^2 = 175.30$; $df. = 43$; $Sig. = 0.00$). No significant differences were found between the three skills’ constructs and type of organization, gender, and employed/unemployed variables.

4.3 Skills development model proposal

In order to respond to research question four (RQ 4) “What are the lessons learnt in order to propose a theoretical model to develop skills in higher education management courses?”, a model proposal for the development of skills needed by the industry can help the universities to structure a possible framework and give practical instruments to help the students acquire important skills for the market place and also improve organizational competitiveness.

This model proposal tries to show the relation between organizational management skills and the skills developed by management courses in higher education. The main goal of the model is to help create a conceptual and empirical framework that contributes to promote the performance of the employees and the success of organizations.

The main questions of this model are: do universities provide skills that match the organizations’ needs and help to improve employee’s performance? Do the management

Table 5 Perceived development of skills by the students (1 = no development; 2 = weak development; 3 = moderate development; 4 = considerable development; and 5 = strong development)—(Cronbach's alpha (number of items) Mean (1–5) (SD))

Rank	Skills	Mean	SD
	Management skills Cronbach alpha = 0.87 ($n = 7$)		
1	Business strategies	3.30	1.23
2	Internationalization strategies	3.30	1.22
3	Management of strategic deals and alliances	3.30	1.18
4	Diversify the business	3.20	1.23
5	Social and relational skills	3.20	1.18
6	People management	3.20	1.16
7	Communication	3.20	1.16
	Leadership skills Cronbach alpha = 0.78 ($n = 10$)		
1	Employees performance	3.27	1.19
2	Development opportunities	3.22	1.25
3	Motivation of employees	3.15	1.23
4	Satisfaction of employee	3.12	1.26
5	Corporate governance	3.12	1.25
6	Communication	3.07	1.25
7	Managing expectations	3.07	1.21
10	Integrating cultural differences	2.97	1.22
	Innovation skills Cronbach alpha = 0.89 ($n = 9$)		
1	New forms and models of work organization	3.28	1.22
2	New technologies	3.26	1.24
3	Organizational change	3.25	1.25
4	Initiative, decision taking and responsibility	3.23	1.20
5	Quality management	3.22	1.26
6	Hygiene procedures and security at work	3.19	1.23
7	Production management	3.19	1.22
8	Creativity and innovation	3.14	1.26
9	New management models	3.14	1.21

course programs have well defined learning activities that help students to acquire practical skills to be applied in managerial functions?

The model proposes that universities offer theoretical as well as practical skills both important for the student to perform a job, and this can only be achieved with an integrated approach to university–industry, fundamental for organizational development and for the students to understand the market needs.

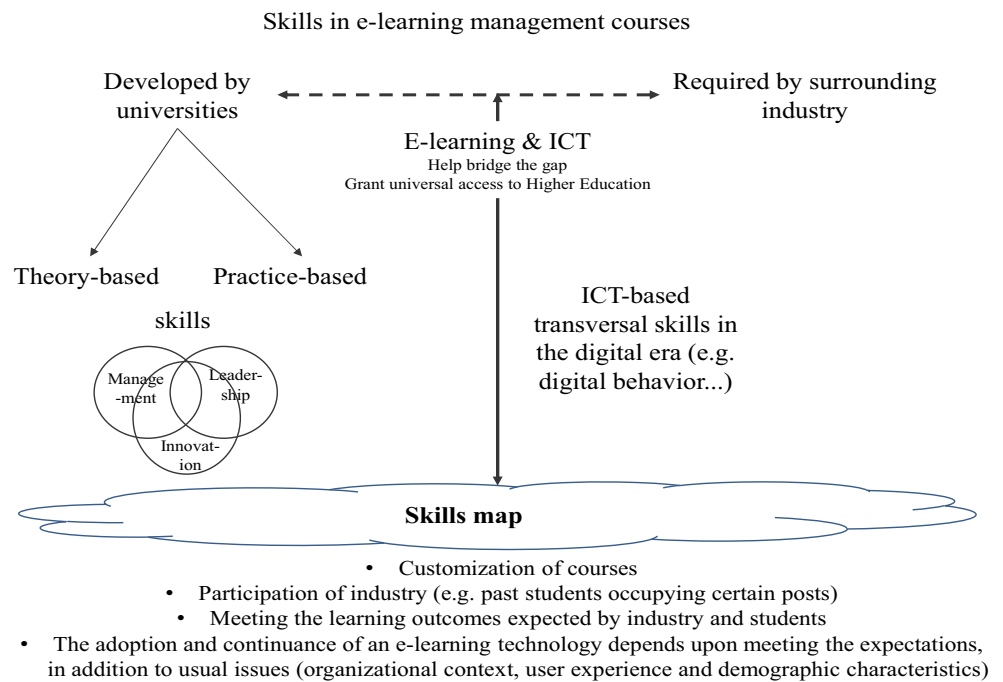
Technology is also an important variable to consider in a model for skills development. It allows students to take control of the process by directing their own path, though the responsibility to ensure the development of knowledge and skills is also the most important role of the university.

An important condition for implementing this model, previously revealed from the research, is the overcoming of obstacles to the industry–university approach. Several obstacles, namely culture and the inexistence of mechanisms that facilitate the exchange of practices among universities and the industry are the base for the alienation of these two worlds.

In order to overcome such obstacles, organizations could map the skills needed and work in the course programs with the universities. The skills maps can be an important management tool for organizations and also a strategic tool for universities to redefine their course programs.

Figure 1 summarizes the final framework developed from this study. The gap between the skills the industry requires and those the universities develop may be bridged by considering them in a map jointly. This map should consider the type of skills developed by university teaching, namely those based on theories and those based on practice. When developing their teaching programs, universities should consider the transversal skills relative to management, leadership, and innovativeness. These skills are even more critical when it comes to e-learning due to the lack of face-to-face interaction among participants. On the other hand, e-learning facilitates universal access to training, in particular to ICT-based skills. The evolution of tools emerging from the digital economy (big data analysis, the possibility to integrate egressed students and industry representatives

Fig. 1 Scheme of the process for the development of skills in e-learning courses



by means of ICT tools...) makes it possible to bridge the gap if, and only if, the e-learning technology employed meets the expectations of every actor in this teaching–learning process. In summary, the e-learning technology adoption and thus continuance will be possible essentially because of the e-learning methods’ appealing features to meet the needs easier and quicker compared to traditional on campus methods, in particular when it comes to the knowledge economy. Furthermore, the e-learning methods are crucial in order to grant universal access to Higher Education regardless of the context: anyone with a laptop and an internet connection can study for a university degree.

5 Contribution and conclusions

The motivation for this research has its roots in the lack of systematic approach among industry and university in order to identify the managerial skills required in the labour market. Its identification is a step required for what needs to be met. Across the literature, there has been little support connecting these two intertwined levels when it comes to e-learning, i.e., what the industry demands relative to what it is taught in higher education institutions. E-learning plays a major role in easing universal access to higher education by means of ICTs.

In this context, two approaches to skills development can certainly be identified: the organizational development approach and the universities development approach,

which can be complimentary, approaching the industry to the university context.

This exploratory study has identified three types of skills across documentary analysis of prospective studies in industry, namely management, leadership, and innovation. Following its identification, the study has analysed the perception of the students from higher education management courses regarding the level of development of those skills performed through an e-learning platform.

According to the students, the skills required by the industry have had a moderate development in those courses. This finding leads us to rethink the pedagogical model of management courses that are taught at higher education level by means of e-learning platforms.

We have found significant relationships between perceived management skills development and the student’s job, though no significant differences between the three skills constructs—management, leadership, and innovation—and type of organization, gender, and employment variables.

This study will help universities and the industry to be more integrated and to rethink their strategies according to skills development in order to respond to the challenges of the ever-changing needs in the market.

The present study also contributes to two dominant theoretical approaches of the unified view of information systems acceptance [35] and information systems continuance [3]. In this initial stage of the study, evidence has shown that perception plays a role on future explanation of how much can e-learning courses develop the skills

required by the industry. This could be considered a proxy measure for the performance of the e-learning system. There are certain differences in that perception due to some of the individuals' characteristics (job position), while the skills actually developed by courses are the same for all. Then, it is plausible to assume that the continuance intention of users will be dependent not only upon how well the course and the information technology perform relative to expectations, but also how the same reality is perceived differently depending on individual characteristics. This calls for more thorough studies at individual level so that further knowledge of perception determinants can be gained to adapt the information system to each individual's conditions. This adaptation is very close to the idea of one individual, one tailored fit course, which will be a next step in the customization of e-learning. This upper level step may constitute the ultimate framework for granting universal accessibility to higher education by means of e-learning technologies.

The main contribution of this work is the confrontation of the skills developed by the universities in their management courses with those required by the industry, which presents a certain gap between both. This review tries to make a call for universities to provide skills that match organizational needs.

Analysing the current curricula of management courses, it is possible to identify some missing or underdeveloped skills, listed below.

Management

- Business diversification
- Social and relational skills

Leadership skills

- Corporate governance
- Communication
- Managing expectations
- Integrating cultural differences

Innovation skills

- New forms and models of work organization
- Initiative, decision taking, and responsibility
- Creativity and innovation
- New management models

Such skills are hard to teach because they are linked to behaviours that are better taught in campus mode. Instructional designers and interface architects play an important role in that respect, developing simulation software and creating scenarios based on real situations.

In order to develop this kind of learning resources, these professionals also need to develop essential skills that can enhance the learning process, as described in the following.

Instructional designer

- Knowledge about learning theories and instructional design models;
- Course and curriculum planning skills;
- Knowledge of course development software;
- Knowledge about Learning Management Systems;
- Visual design skills;
- Ability to conceive storyboards;
- Ability to write instructional text, audio, and video scripts.

Interface architects

- Conceptualization and visual communication abilities;
- Design, production value, and attention to detail skills;
- Knowledge of Photoshop, Illustrator, InDesign, Fireworks, and associated design tools;
- Knowledge of user interface design patterns and standard UCD methodologies across multiple platforms;
- Written and verbal communication skills.

6 Limitations and further research

Certain limitations of this study are acknowledged next. First, there was only a small sample selected, with a total of 117 valid participants. Future studies may look at a larger and more diversified sample of students so that the results can be generalized and extrapolated to other contexts.

A second limitation is that we have only collected the skills required by the industry by means of documentary evidence (essentially industry reports). It was not possible to conduct additional interviews to fully cross-validate the list of skills needed by the labour market. However, the list was obtained from industry reports that are elaborated with the contribution of industry representatives. Further empirical studies are required to check the impact and size of the gaps identified. The present study focused on the identification of the *whats* instead the *how much*s.

By the time of documentary review of skills required by the industry (the end of 2014), some new skills may have risen in necessity. This is the case of emerging profiles such as creative thinking, and data scientists in the internet industry, among others. Future research should revise and complete the list provided in the present study.

Once further empirical evidence is available, it will be possible to propose a theoretical information system for the development of skills in higher education management courses taught in e-learning platforms, so that universities can meet the industry's needs. This model should consider the existence of different profiles among students and the role of perceived skills to ensure this type of information systems continuance.

In future research, it will be interesting to analyse the pedagogical resources, the learning activities and the methodologies used in management e-learning courses and their impact on bridging the gap between industry and higher education. Dynamic perspectives of how these gaps evolve over time will be beneficial to fully understand the shifts and changes in the existing gaps.

Another interesting research to be conducted is to identify and analyse the processes of skills development used by companies and create that theoretical model to develop these processes in higher education, suitably transforming the courses for the market requirements and competitiveness.

A parallel future research avenue is the development of a typology of skills that could help build a framework of pedagogical content for developing student skills under the umbrella of universal access through e-learning technologies.

It is also important to apply this methodology to other types of courses borrowing skills from other organizational functions. In summary, this exploratory study has shown that studies conducted in the context of information system continuance, and the technology acceptance model should consider the existence of different user profiles and the role of cognitive perception. This is particularly relevant to grant universal access to e-learning courses in higher education institutions.

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