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Bridging the gap between Education, Technology and employment in the management area

Reducción de la brecha entre la Educación, la Tecnología y el empleo en el área gerencial

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Abstract

The use of technology is considered a key piece to the success and business performance, education and employment that are important to the future of evert organizations. In this context of technological competencies a content validity study was conducted with fourteen professionals in the area of computation and management. The content validity analysis allowed an analysis of reagent to calculate the estimate of internal consistency and discrimination indices in a sample of 312 managers. Consistency coefficient instrument were also determined using the Cronbach Alfa. As a final result of the work, factor analysis and the eigen value was used to establish competence in the use of software applications by managers. This study allowed us to propose a conceptual model of technological skills in the labor market.

Resumen

El uso de la tecnología se considera una pieza clave para el éxito y el rendimiento empresarial, la educación y el empleo que son importantes para el futuro de evert organizaciones. En este contexto de competencias tecnológicas se realizó un estudio de validez de contenido con catorce profesionales del área de informática y gestión. El análisis de validez de contenido permitió realizar un análisis de reactivo para calcular la estimación de los índices de consistencia interna y discriminación en una muestra de 312 directivos. También se determinaron los coeficientes de consistencia del instrumento mediante el Alfa de Cronbach. Como resultado final del trabajo, se utilizó el análisis factorial y el valor eigen para establecer la competencia en el uso de aplicaciones informáticas por parte de los directivos. Este estudio permitió proponer un modelo conceptual de competencias tecnológicas en el mercado laboral.

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Introduction

In times when technology is really critical for the future of a company, the most repeated questions asked in the last two decades of the twentieth century by management bodies refer to the way in which the training of the workforce should be approached. Of course, training, integrating and qualifying is not the same as in past decades, when businessmen did not have to work with economic, technological and social globalization (Aguirre, 1998).

The failure in this attempt is basically due to two reasons. The first is the lack of a coherent plan to introduce technology to the workforce. The second reason is the lack of a flexible strategy for teaching the mechanics of how to perform a given task (Aguirre, 1998). According to Blanchette (1998), it is also important to recognize resistance to change.

This applies equally to the learning of new technologies, since many people fear that it will disrupt the established order. If the organization does not address these fears, employee performance will be adversely affected. The introduction of new technologies will be a process fraught with uncertainty and resistance.

When an organization identifies the technology that will be introduced into the company it must know what type of technology it is launching, how it uses it, and who will use it, as well as allow employee participation in the technology integration process. It is best to talk to those who will be directly involved and ask them for ongoing communication during the incorporation process (Blanchette, 1998).

The middle of our century will go down in the history of education as the most spectacular expansion. Worldwide, the number of students enrolled increased more than six-fold. Between 1960 (13 million) and 1995 (82 million) but it is also the time when the disparity between industrially developed countries, developing countries and, in particular, countries in terms of access to higher education and research and the resources available to them became even more acute.

Knowledge sharing, international cooperation and new technologies can provide new opportunities to reduce this disparity. Higher education has shown ample evidence of its viability over the centuries and of transforming itself and enabling societal change and progress.

Given the scope and pace of change, society is becoming increasingly knowledge-based, which is why higher education and research are now a fundamental part of the cultural, socioeconomic and ecologically sustainable development of individuals, communications and nations.

In view of these considerations, the analysis and anticipation of society's training needs must be strengthened in the world of work. In view of this point of view of a permanent source of training, improvement and recycling of professionals, higher education institutions should take into consideration the trends in the world of work and in the scientific, technological and economic sectors.

In order to meet the demands posed in the world of work, higher education systems and the world of work must jointly create and evaluate learning modalities, transmission programs, and assessment and prior recognition questions that integrate theory and on-the-job training.

Within the framework of their prospective role, educational institutions could contribute to fostering job creation, without this being the sole purpose. This initiative could facilitate the employability of graduates, who will increasingly be called upon to create jobs rather than merely seek them.

Higher education institutions should provide students with the possibility of fully developing their own abilities with a sense of social responsibility, educating them to participate actively in democratic society and to promote the changes that will bring about equality and justice (Aguirre, 1998).

Literature review

Technology is preliminarily considered as the incorporation of scientific knowledge into the productive field with the purpose of obtaining new inputs, new products, new devices, new procedures, new systems or substantially improving existing ones (Díaz, 2003).

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According to this definition, technology operates in the productive field and exerts some influence on production and productivity (Chávez, 2005). In order to face new training requirements and new challenges of technological competence in the workplace, many universities in Puerto Rico need to bring about transformations and carry out profound changes in terms of governance, organizational structure and forms of operation.

A key aspect of technological competencies is the ability to organize traditional disciplines differently, taking into account technological integration and new technologies. As well as transformations in industry operations that are rapidly impacting the labor market.

With the commercialization of teaching, teachers as a work force enter into a production process designed for the efficient production of merchandise and, therefore, will be subjected to all the types of pressure to which production workers have been subjected in the other sectors of industry, where hasty technological conversion is imposed from the top.

In that context, the teaching profession has rather more in common with the historical sufferings of many other skilled workers than it is willing to acknowledge. There are situations where activities restructured through technology, autonomy and independence for control over work, will be necessary to transfer knowledge.

Like industry, technology is being deployed by management, first and foremost, to discipline, disqualify and displace labor (Noble, 2000). Education, on the other hand, has a very important dual role. On the one hand, it has to strengthen the personnel in charge of technological integration. On the other hand, it has to influence the new jobs that are generated as a result of the country's development through programs to strengthen human capital formation.

These programs should have priority for higher education and for achieving competitiveness in technology. Thus, in order to relate education and technology with the objective of increasing employment in the coming years, it is necessary for the level of employment to grow in accordance with the technology adopted.

In order to find the counterpart on the education side, which consists of being able to estimate in a given period the number of people that need to be prepared and trained according to the different educational levels and thus satisfy the personnel requirements (Noble, 2000).

Methodology

What are the standards for empirical validation of the inferences of an instrument to measure technological competencies of management graduates?

This study aimed to develop and validate inferences about the validity and reliability of an instrument that measures technological competencies in managers. A content validity study was conducted using a total of 14 experts in the use of technology in organizations at the managerial level. Lawshe's (1975) content validity method was used.

This allowed the calculation of content validity ratios and the elimination of those competencies and sub-competencies that did not meet a minimum content ratio of .51 as established in Schipper's table (in Lawshe, 1975). The results of this analysis served as a preamble for the item analysis and the estimation of internal consistency reliability.

The ability of the competencies to discriminate between individuals who appear to possess greater technological proficiency and those who do not was evaluated. When the inventory was evaluated in its entirety. All items presented discrimination indexes equal to or greater than .30. Kline (2002) points out that the items that discriminate adequately must have indices equal to or greater than .30.

When evaluating the items by each of the sub-competencies, the same favorable results were obtained; the items obtained discrimination indexes equal to or greater than .30 in the instrument as a whole and also across all the sub-competencies. As a result of these results, it can be concluded that the instrument contains 59 items that discriminate adequately.

On the other hand, the internal consistency reliability of the instrument as a whole was evaluated. The Cronbach's alpha coefficient of internal consistency reliability for the instrument as a whole was 98.

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This means that the instrument's competencies demonstrate acceptable levels of internal consistency reliability. Authors such as Anastasi and Urbina (1987) argue that an adequate internal consistency coefficient should be equal to or greater than 70.

A content analysis of the competencies was done and it was found that they could be hypothesized to measure a management software applications competency. The competencies were taken and analyzed using the factor analysis technique.

The results indicate that all competencies can be sub-competencies of management software applications. The eigenvalue (6.63) was able to explain 55% of the variance reflecting adequate evidence of construct validity of what constituted competency number 10.

One of the indicators that allows a favorable evaluation of the inferences about the construct validity of both the total score and the competencies was the eigenvalue, which exceeded the minimum criterion of 1.00. Kline (1988) suggests that eigenvalues that are less than 1.00 face difficulties in measuring the inferences of a construct.

Another of the indicators that was used to monitor the logical construct validity were the initial loading factors. Authors such as Kline (2002) establish that for an item to correlate adequately with a factor, it has to be of . 30 or higher.

All competencies met the estimates recommended by authors such as Reise, Waller and Colley (2000), Fabrigar, Wegener, MacCallum and Strahan (1999) and Kline (2002). The initial loading factors were kept at the recommended minimum of .30. Both the eigenvalue and initial loading factors provide substantive evidence.

Second study question

What is the proposed model of technological competencies that responds to the needs of the labor market for management graduates?

As explained, the proposed model makes it possible to identify and relate the set of variables involved in the specification and evaluation of competencies for business administration professionals in management.

This developed model comes from reliable sources and data so that the competencies are considered relevant, it also specifies their scope, allows the construction of evaluation instruments and the study of the meaning of the evaluation results. The model specifies the most relevant variables as well as their relationships and the stages of the assessment process.

For the definition of the competencies, the context of the productive business sector that affect professional performance and the characteristics of the educational institutions that train professionals have been considered. Likewise, it has been considered that the competencies are conditioned by the field or area of discipline in which the graduate works. Once the desired competencies have been defined and technically validated, the conditions and aspects of how their achievement will be evaluated are established.

Once the formal processes have been established, we proceed with the evaluation applied to the instruments under the conditions previously specified. This sequence of a process is not a linear one since there is interaction between different actors and elements involved. On the one hand, there are the institutions of higher education in the educational context and the companies in the context of the productive sector in the labor market.

Moreover, this model allows the results of the evaluation of technological competencies to feed back into the system, influencing the educational system and, more significantly, generating curricular changes.

Discussion, implications and contributions

The productive business context. The productive context of the labor market considers the need to review the competencies that have been declared in different areas of the labor sector and prestigious institutions.

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These competencies are relevant for the development of a country, leading to the recognition of the desirable characteristics of professionals. In this context, competencies assume special forms that must be specified and in turn validated according to the research study that gave rise to this thesis.

In the area of academic discipline, in order to carry out the occupational analysis, it is necessary to determine the characteristics of each field of professional performance, particularly in the area of competencies and their scope. For example, the application of knowledge in project management serves several purposes in the management area, as well as the knowledge of the specialty in the training of teachers of various disciplines.

In the context of the discipline, it includes the analysis of the state of the art of the sciences associated with the profession and a prospective occupational analysis to establish the occupational demand at the time of graduation.

Considering this, the graduate could not only adapt to the demands of the productive sector but will be able to make a better contribution to improve production. For this, it became indispensable to consider the participation of employers and the use of conventional methods to identify technological competencies following occupational analysis.

This process is the formal recognition of the competence demonstrated by the graduate, which are defined in areas of content and execution. These describe the competencies that the student has to develop. It also describes those technological competencies that the student is able to do to show mastery of the content.

The assessment of competencies definitely does not come from formal curricular approval that are awarded through diplomas as the only standard to show competitiveness in the labor market.

This should also be an exercise of knowledge application in critical circumstances having as characteristics that these competencies have a degree of being measurable and evaluable. Once the analysis of the results of those competency standards that have been measurable and attainable has been established, decisions are then made.

This analysis that I present does not intend to establish specific recommendations about some matrices to evaluate competencies. However, the competencies determined should serve as a guide to establish those competency standards necessary for the graduate and to make decisions for the articulation between the productive sector and professional training.

Decision-making is based on the curricular design or its revision based on competencies. This will respond on the one hand to the current scenario in which a worker must have the ability to foresee or solve the problems that arise, propose improvements to solve them, make decisions and be involved to a greater or lesser degree in the planning and control of their activities.

On the other hand, it responds to research on learning, as it proposes an organization that favors meaningful and lasting learning. Competency-based curriculum design can be the starting point for the elaboration, identification and description of the competency elements of a professional role or profile.

It aims to promote the highest possible degree of articulation between the demands of the productive world and the professional training to be developed. The model is considered non-linear and seeks that both components: educational institutions and the productive labor sector continuously feed back to contribute to the training of professionals with the competencies and standards required by the labor sector.

This process should flow in such a way as to reduce the aforementioned disconnection between the needs of the productive sector and higher education related to the professional training of graduates.

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