

# TRENDS AND LABOR MARKET REQUIREMENTS IN THE KNOWLEDGE ECONOMY. A STUDY OF CUCEA GRADUATES\*

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\* CUCEA: University Center for Business and Economic Sciences at the University of Guadalajara. Programs offered: Business, Accounting, International Business, Tourism, Human Resource Management, Financial and Systems Management, Economics, Marketing and Information Systems. At the time of data collection, the recently created programs: Government Administration, Local Public Policy, Management and Environmental Economics, were not yet available. For the second half of 2009 CUCEA had registered more than fourteen thousand undergraduate students, which makes it the largest campus at the University of Guadalajara (U de G).

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## Resumen

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**E**l objetivo de este trabajo es describir las tendencias y requerimientos identificados en el mercado laboral de los egresados de las áreas económico administrativas de la Universidad de Guadalajara. El análisis considera el papel que debe jugar la universidad para formar profesionistas que puedan competir exitosamente en una economía dinámica, donde el conocimiento es el principal valor agregado y la información crece exponencialmente. Los resultados principales muestran la necesidad de un egresado multilingüe, híbrido, capaz de administrar la tecnología, con conocimientos avanzados de diseño y programación, pero sobre todo independiente, autogestivo y capaz de aprender a aprender.

### Palabras clave:

- Mercado de trabajo
- Economía del conocimiento

## Abstract

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**T**his paper describes the trends and requirements identified in the labor market for business graduates from the University of Guadalajara. The analysis considers the role that the university must play in training professionals able to compete successfully in a dynamic economy, where knowledge is the main value added while information grows exponentially. The main findings show the need for multilingual, hybrid, technology savvy graduates with advanced knowledge in programming and design, but above all self-directed, independent and able to learn how to learn.

### Key words:

- Labor Market
- Knowledge Economy

## Introduction

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**A**t present, it is a truism that we live in the age of knowledge given the exponential growth of information. The rapid development of information technology and communication, virtuality and remote communication, are evidence of this. However, the differences between countries, regions and institutions are huge, therefore it would be dubious of us to assume that we are part of this knowledge society if we do not take part in knowledge production.

For decades we have been immersed in economic dynamics that revolve around knowledge as the main generator of added value. At the early stages of human development, land and natural resources were the main generators of wealth. Nowadays, this is the role of knowledge. Countries and regions that generate the most knowledge enjoy better living standards and higher per capita income. Singapore, Canada, Iceland, Finland, the U.S., and others have in recent years been at the forefront in terms of competitiveness indexes (IMD 2006). Companies with the largest investments in research and development are those holding market leadership positions.

A distinctive phenomenon in the knowledge society is precisely the rate at which knowledge is generated, accumulated, and then depreciates, and above all how it is produced due to the existence of knowledge-intensive communities (David and Foray, 2002). The ability for learning becomes critical in this process, and the extent to which individuals, groups, organizations and communities learn quickly to generate knowledge networks proliferate, among different types of participants.

Knowledge and/or innovation networks are a feature phenomenon of the knowledge society. In these, stakeholders interact systematically for producing knowledge. At the national and regional levels these dynamics incorporate companies, government agencies, research centers, universities, and liaison organizations, among others.

The literature has long shown that research universities play a central role in this process (Leydersdoff and Etzkowitz, 1998). Their contribution, from the training of high quality human capital with ample mobility, to the creation of knowledge, the technology transfer, the upgrading research infrastructure for multiple users (academic and business) and the incubation of high-tech companies, are among the most salient.

It is also clear that few universities in developing countries take part in this process, not even in terms of human resource training with a suitable profile to stimulate such a process capable of trickling down knowledge into society.

## Labor market and performance

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Performance of university graduates is often analyzed in terms of the rankings conferred by the labor market, particularly in terms of employment rates as a measure of the quality of education received. However, the measuring of both the quality of institutions and the social relevance of higher education as a whole continues to represent a problem (Lindberg, 2007).

The purpose of this section is to reflect, based on the analysis of the literature, on the issues that shape the knowledge society, the characteristics of the human capital that are actively shaping this society and some previous studies on the labor market. The aim being to analyze the findings about the observed requirements in an economy based on the production of knowledge. As a university, we should not fail to recognize them as they may be useful in identifying areas that require further research.

### Global trends and knowledge.

The labor market is framed by two major trends: globalization and the knowledge-based economy. Outsourcing, the fast assimilation of new changes, technological innovation, new forms of distribution, the constant search for efficiency, high mobility of human resources, organizational flexibility, the intensive use of information technology and communication (ITC) generate new forms of production and high added value markets where human capital plays a central role.

The worldwide electronics industry distributes its processes in different regions of the world to reduce costs while maintaining research and design centralized in large headquarters, taking their assembly lines from one location to another in search of cheaper labor costs. Contrary to this, there are some companies and industries that move to regions with better infrastructure (industrial, research and services) and access to high-level human capital. In particular, recent cases are those in the medical biotechnology and software industries in Ireland. The U.S. attracts high level scientists, engineers and technicians worldwide. While Canadians, Chinese and Indians migrate to this country, Canada is attracting talent from Taiwan.

The biotechnology cluster in the Vancouver region has generated a new dynamism in the area, allowing it to evolve from a natural resource-based economy to one that develops knowledge. The role of research universities has been central to generate a critical mass of researchers and entrepreneurs willing to risk resources to generate new business. In this case, basic knowledge has become the new engine for the economy by attracting ever more venture capital and fostering the creation of new organizations with specialized services: intellectual property advisory, consultancy for the recruitment of senior staff, nonprofit organizations that seek to link all participating organizations, legal experts and international business (Arechavala

and Díaz, 2004).

This reconfiguration process was fueled by economic infrastructure and human resources from the university (researchers, marketers and technology entrepreneurs), but also creates a virtuous circle dynamic, where new graduates are trained to manage, advise and startup biotechnology firms, as well they learn to negotiate with big pharma, they know management and technology, and learn to commercialize the technology in global markets as their form of entry into the labor market.

At the other extreme, traditional sectors are operating in ever-smaller niches, with little value added and low profit margins. This process can be reversed to the extent that organizational innovations, processes, products and/or services can be incorporated to allow them to reappear in the market. High-tech industries are the ones that have generated a new profile in the global labor market, defining new working modes and key features for human capital. We ought not to remain oblivious to these.

### **Characteristics of human capital in the knowledge economy.**

Globally, labor trends point to a clear distinction between those workers who are part of the dynamics of knowledge production and those who work in more traditional sectors whose competitiveness is focused on low labor costs. The postings of lower value added, labor intensive and repetitive processes are occupied by personnel from the emerging economies (Ruiz D., Piraeus and Schrank, 2005). Even many engineering tasks are being channeled to these countries because of their low cost.

In this context workers are differentiated into three groups: those whose tasks are centered around labor, repetitive activities with an hourly wage, have been called blue collar workers. White collar workers are employees working in offices with administrative and coordination tasks, with a higher level of responsibility. Only gold-collar workers are those able to learn by themselves, generate new knowledge and have the ability to solve problems. They are creative, independent, autonomous and recognize the importance of teamwork (Wonnacot, 2002a). Interpersonal skills also become highly valued characteristics in the labor market (Wonnacot, 2002).

In countries like Australia, for example, there are opportunities for professionals capable of taking responsibility for their own development, investing in their education and keeping themselves up-to-date (Hall, Buchanan and Gillian, 2002). This also happens in developing countries in sectors such as the software industry where self-learning is the main mechanism for keeping up with current knowledge (Díaz, 2007), through virtual communities (Ruiz D., Piore, Schrank, 2005).

This trend had been anticipated as one of the major changes in the mechanisms for the production of wealth in an economy, accompanied by a trend in education less oriented towards specialization and more focused on gene-

ral knowledge, researching and learning skills (Thurow, 1999). Flexibility, in this context, seems to be displacing specialization, where the individual's ability for learning and venturing into new areas of knowledge, as well as identifying future requirements early becomes a highly valued skill.

In the case of Taiwan the internationalization of its business has been supported by a change in the orientation of university education in the area of international business. Currently, knowledge on forms of global competition, the impact of cultural factors, mastering foreign languages, advanced information management technology and a broad knowledge of legal issues in global business are fostered. Learning about the operation of world class companies is emphasized, and not only about the operation of companies in a single country, as traditionally occurs (Yuche, 2001).

An analysis of the skills required by small businesses in European countries found, for example, that in Italy the ability to assess relationships between customers, agents and wholesalers, as well as expertise in logistics to reduce delivery times and therefore costs is highly valued. While in Ireland it is important to be able to take on senior positions, where employees can replace managers and even owners in decision-making processes (Hassid, 2002).

In the research presented in this paper, we further propose that workers should have some of the following skills to solve problems that occur frequently in companies that want to compete in international markets: knowledge of foreign markets, languages, communication skills, ample management of information technology, bargaining capacity in international contexts and databases and information on world class management. Another aspect emphasized as relevant is work experience prior to entering the labor market even if it is not related to the area of specialization. In the U. S. a program has been created to ensure that university students acquire this experience, which fosters the development of discipline, positive habits and decision making, among others (U.S. Department of Labor, 2004). England also reports programs where students, as part of their training, work in small and medium companies for applying their specialized skills and knowledge in the areas that most interest them (Fraser, Storey and Westhead, 2006).

Autonomy, discipline, language skills, teamwork and the ability to communicate effectively, plus creativity and flexibility are some of the characteristics identified in the most valuable professionals in the global labor market. A reality is that the best and brightest are migrating into knowledge zones, a trend which is associated with high human capital mobility. In this context, one of the most important skills in graduates which stands out is the ability to learn new skills and continue a systematic and long-term learning, driven by their own motivation and independence (OECD, 2004).

## **Studies of program completion and labor markets.**

Identified labor market studies tend to be more oriented towards quantifying its size, predicting its growth and analyzing its capacity to absorb job

demand according to the expected number of graduates. We must highlight that in Mexico, the projection by the ANUIES (ANUIES, 2003), states that a sustained annual growth of 6.7% in the labor market is required, in order to meet the expected number of graduates from higher education institutions. Otherwise, the main alternatives for professionals will be: open unemployment, inactivity or migration.

These data are consistent with another study to determine the employability of graduates (Rodríguez, 2004). Here we argue that the existing workforce is being wasted because the labor market cannot provide the number of jobs needed. As long as this situation continues, migration trends, economic development and the opportunity in terms of the current workforce will be lost.

The overall assessment derived, though in purely quantitative terms, is that the market in Mexico is not generating mechanisms to incorporate new graduates, even though the graduation rate observed, in comparison with Latin America, is lower (Arechavala and Díaz, 2006).

There are approaches that have integrated proposals derived from the theories of human capital and the economics of education to analyze the link between academia and the labor market. From these approaches it is noted that the number of variables for measuring job insertion and graduate performance make it difficult for developing analytical frameworks, but it has also been found that variables such as socioeconomic background, appear to hold greater weight along with the characteristics of the labor market (Navarro, 2003).

Comparative studies that analyze the characteristics required by employers in different European cities were also identified. The most important results emphasize the need to understand the various customs of different countries as they greatly influence the way organizations function. As well, great capacity for teamwork and leadership are also sought after (Mora, García, Carot and Vila, 2006).

Other studies, focus for example, on the difficulties of students in accessing their first job, how long it takes, their wages and the levels at which they are hired (Lianos, Asteriou and Agiomirgianakis, 2004, Perrone and Vickers, 2003). The overall picture is broad and there are various approaches to address the problem. A great variety of comparative studies in the European Union seem to respond to the high mobility of staff.

## Methodology

The overall objective of this research is to analyze the performance, integration and typical career paths of CUCEA graduates in the metropolitan area of Guadalajara, in order to identify trends and anticipate demand. The research presented here is aimed at generating market information, as well as to point out recommendations that could be incorporated to improve educational programs for students.

Performance analyses often oversimplify the progress and processes un-



der evaluation, thus generating medium quality studies. Therefore we decided to perform a more comprehensive study that would minimize the biases of statistical measuring. Hence, it was deemed appropriate to analyze performance and employment trends from different angles: 1. From a business and public sector angle, considering the information they have about the future needs of the labor market and state economic policies. 2. The employers' perspective on the quality of graduates, their knowledge and skills, considering also the future qualities required. 3. The perception of the graduates about the training received in terms of what the labor market requires from them. 4. The distribution of graduates by employment field and career paths according to the type of occupation.

The main stakeholders selected for the study were: graduates, businesses that offer employment, and people who identify trends and have knowledge on the needs of different business sectors and the government (key informants or experts).

We designed a methodological strategy that incorporated multiple qualitative and quantitative methods for data collection and analysis, in an attempt to respond to the different needs for information required by the investigation. In the first stage information necessary to conduct the fieldwork was gathered. Directories of business associations and government agencies were developed. Information was obtained about the universe of companies in the Guadalajara Metropolitan Area (GMA) from the Business Information System. We retrieved previous alumni directories. We identified the main databases at the national and international level for statistical information on the labor market in economic and business administration areas.

In a second stage we conducted 86 semi-structured open interviews with: 1. Business leaders, business executives and prominent business people. 2. Government officials with an understanding of labor market needs. 3. Human resource managers and recruitment agencies. Interviews were conducted along the following lines: A. The knowledge that the respondent has on the CUCEA and its graduates. This section allowed us to evaluate the quality of information provided by the interviewee, as it served a specific control function. B. Labor market requirements to learn about its current characteristics. C. Performance and quality of graduates in terms of their knowledge and skills, current and future. D. Trends and future requirements in relation to global economic forces as well as national and state development policies. E. CUCEA's function and the university in the development of the region as perceived by respondents. F. Feedback and suggestions. This section was left open to address issues not included in the script and deemed relevant by interviewees.

Once the interviews were transcribed and analyzed with the support of qualitative analysis NUD\*IST software. We performed an inductive coding which allowed to identify important issues and classify the information gathered. At the same time, according to the research objectives, runs were performed aimed at identifying the thematic lines described above. We also performed searches by actors: teachers, graduates, etc., which were associa-



ted in a later stage to the searches on topics such as quality. The interviews also allowed to define the language and identify issues relevant to later develop the directed survey for the employers.

**Table 1. Collection Methods**

Axes	Method	Sample
Perceptions of performance. Labor market requirements. Identification of trends.	Open Semistructured interviews	86 interviews Sample defined by Criteria.
Performance Evaluation. Labor market requirements. Roles and salaries.	Employer Surveys	2197 Random stratified sample
Update directories. Level of satisfaction with education received. Roles and salaries.	Graduate Surveys	3550 Telephone surveys with Graduates we were able to locate.
Growth trends and general context. Labor supply and demand.	Collection of job, wages, graduation and other indicators.	ANUIES, RICYT (Regional Science and Technology Institute), etc. databases.
Source: author's.		

In the next phase graduate surveys were carried out in order to update their general information and determine their levels of satisfaction with the training received in terms of what their employers require from them. These surveys were conducted from the beginning of the investigation parallel to other activities due to the difficulty of locating all graduates. Particularly the information gathering was aimed at recent graduates considering that they best represent their training, according to current programs, as well as graduates from previous years we were able to locate. The surveys collected are centered on classes 2000 B to 2005 B.

A fourth stage consisted of the application of surveys to a stratified sample of companies in the GMA. This sample represents 10% of the 16 strata (primarily business areas, excluding areas that are mostly residential). The spread of companies is random for each of them. The sample for 2005 covered at that time a total universe of 210,479 companies according to business directories. The estimated statistical error was plus or minus 2% with a reliability of 95%. The aim of the employer survey was to identify general trends in the labor market and their assessment of the performance of graduates. At this stage, the need to corroborate the information from the interviews made it necessary to work with a statistically representative sample, with more specific and standardized information on the characteristics of graduates, their performance in relation to graduates from other universities, the most valued traits for their recruitment, labor market trends as well as demographics and the general characteristics of respondents.

An additional monitoring of statistical indicators of the labor market in databases such as UNESCO's, the RICYT's, and ANUIES's allowed for the descrip-

tion of global trends in the dynamics of graduates, wages, fees, labor demand, graduation rates, among others. This information was supplemented with a search for research papers on the subject, working papers, conference papers, theses and national and international policy documents. These activities allowed to contextualize the situation studied as well as to identify empirical research in the area as a benchmark for analyzing the findings.

Performance has been widely studied quantitatively, but for the purposes of this study it was important to include qualitative aspects such as perceptions, opinions and satisfaction. The dimensions for the study of performance are generally quantitative (such as wages, positions in the hierarchy, types of employers), and qualitative (career path and professional growth, knowledge, skills and attitudes). This is complemented with the opinions of experts on labor market future needs and trends. The descriptive study is intended to generate recommendations for the university.

Among the main limitations of the study are the reduced time for data collection, failure to consider public sector agencies among the sample of employers, and finally failing to carry out in-depth interviews with graduates. These interviews could have generated information for contextualizing satisfaction levels and profiles of successful and unsuccessful graduates in the labor market. We suggest exploring these issues in further research.

## Analysis of results

The following section presents some of the most significant results of the fieldwork. Although this is an exploratory study, it allows to learn in detail about the compared performance of CUCEA graduates, the characteristics sought by employers, their roles and salaries comparatively, and trends that will define the labor market in the medium and long term.

## Distribution, roles and salaries

The distribution of the sample of graduates presents a higher percentage of professionals under the age of 25 (79%). This is explained due to the fact that among most recent graduates only 1% are 36 years old or older (Figure 1). The program with a greater presence in the sample is Accounting with 35%, followed by Business Administration with 16% and Marketing 13%. The Accounting program accounts for the highest percentage of graduates with 38%, followed by marketing with 31%. 64% of respondents were female and 36% male. The first group is concentrated in the Accounting program.

In terms of updating their knowledge and skills, only 5% of respondents reported having completed specialization and/or graduate programs. Again, Accounting had the highest ratio followed by Financial Management and Systems. In the case of Accounting this may be explained by the constant updating required due to the annual changes in the tax regime, for example. However, according to the requirements of a knowledge economy and global markets this percentage is extremely low, as the literature suggests that

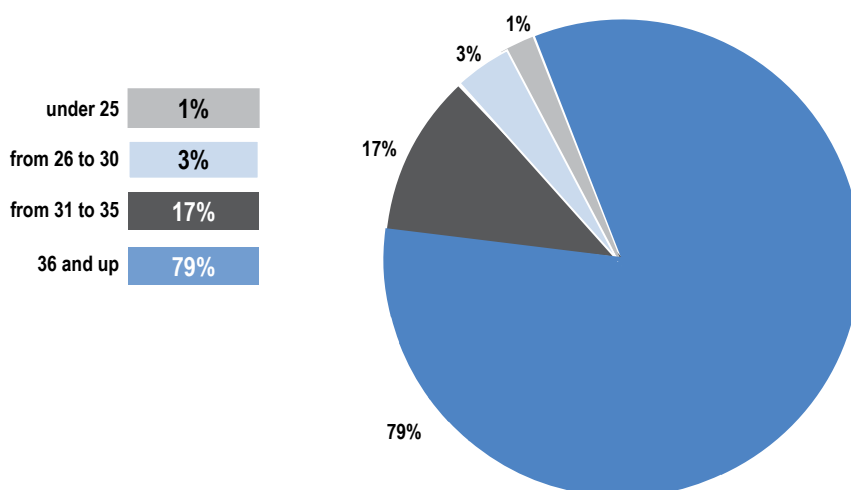
professionals with a comprehensive academic curriculum and postgraduate studies are better paid (Hall, Buchanan and Gillian, 2002). Although there are studies that report that in most developed countries competition is so fierce that it is common to find graduates and postgraduates with an extensive academic background in low-level positions (Coullon, 2002).

In the sample of graduates surveyed it was found that only 15% have previous work experience upon starting their first job after graduation, and again Accountants are those with the highest percentage, followed by Marketing graduates. In countries like the U.S. and Germany there are programs designed to establish the legal framework to allow students to have systematic learning experiences in the labor market (U.S. Department of Labor, 2004), given the fact that employers often require experience. A study conducted in Australia shows the difficulty of finding work without work experience and job training (Perrone and Vickers, 2003). Lack of experience is a recurring problem in many universities and countries. We must devise strategies to address this issue.

Regarding the salary range it was found in surveys with employers, that the average pay is between three and six thousand pesos (see Figure 2). This implies that CUCEA professionals are below the average wage in the GMA for business and administration areas. The range reported in the aggregate data is between five and ten thousand pesos (Arechavala and Díaz, 2006).

Graph 1

CUCEA Graduates Age Range from 2000 B to 2005 A



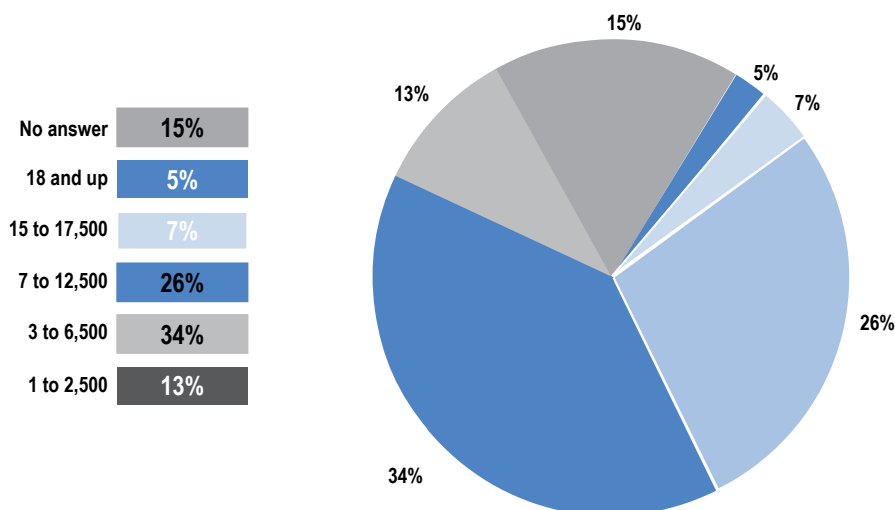
Source: Compiled from data collected in the field.

We may infer by the wage level that the graduates' jobs are at the operational level of administrative support staff. This is also confirmed as noted in interviews with experts who argue that CUCEA graduates do not have, in general, the training required for higher postings. However, the same surveys show employers hire University of Guadalajara (U de G) graduates more frequently and in greater numbers.

Recruitment and human resource agencies suggest that there is a tendency to lower these graduates' wages, because they are willing to work in positions of lower responsibility for lower wages. Even if the wages reported by employers may be higher than those actually paid, they reflect that the general wage levels prevail.

Graph 2

## Salaries as Reported by Employers



Source: Compiled from data collected in the field.

Graduates from Marketing, followed by Accounting and thirdly, Business are the most sought after by companies. The low integration of graduates from private universities may be explained on the grounds that these start their own businesses or hold management positions (Díaz et al, 2007). The latter was corroborated in interviews with experts.

The information collected shows a 5 to 2 proportion of graduates from the U de G, with respect to private universities. It is also important to note that most employers are small businesses so the organizational structure is fairly flat, requiring mainly middle managers and assistants. In these companies the owner is usually the CEO and the manager, and accounting tasks are assigned to specialists in the area, but in general these are not highly specialized activities.

## Quality and performance

University quality and performance analysis is a complex task, for the various processes taking place within the institution, that necessarily involve an understanding of multiple factors to explain the social role of the whole. The labor market relevance of professionals trained is just one approach among many. In developed countries, the analysis may involve for example, the number of start ups with export activity generated within the university, the number and quality of services offered, the impact of graduates on the economy and quality of life in the region, the level of jobs and wages, the number of entrepreneurs and type of businesses they start, the number of patents licensed to third parties and the number of publications in high impact journals, among others.

Quality and performance may also be studied according to the many actors involved, the substantive processes, support generated by offshoot activities, the regulatory, economic and political environment in which the institution is embedded. Nonetheless, a necessary measure has to do with the local society and the labor market's view of graduates. While it is only one aspect, it may explain the general perceptions and identify critical aspects to improve in the short term.

This communication may allow the university to remain close to the community, and incorporate valuable information for decision making, redefining curricula, opening new programs, forecasting trends, and so on.

The following table provides a differentiation of perceptions about graduates by three expert groups. It is remarkable how complementary the views are coming from the different groups. Respondents point out that even if graduates have an excellent disposition towards collaboration and learning they show knowledge gaps that make them less competitive than graduates from private universities. For example, several experts noted that the knowledge acquired by graduates does not correspond to real labor market and business challenges, for both students and teachers have little contact with the labor market.

**Table 2. Performance Evaluation and Recommendations**

	Business Association Leaders and Businessmen	Government Officials	Placement Agencies and Human Resource Managers
<b>Performance</b>	In terms of capacity there is no difference between CUCEA graduates and those from other private universities. With regard to knowledge and entrepreneurship there are important differences. The lack of English proficiency and lack of expertise are not favorable for CUCEA graduates. Their attitude of service and ability to start from scratch is recognized.	Positively evaluate the readiness of CUCEA graduates. GOs state CUCEA graduates have fewer economic resources and educational elements to become entrepreneurs. GOs emphasize their lack of leadership compared with graduates from private universities.	Graduates from private universities have better performance due to internships. This practice gives them a more concrete vision of the business environment. CUCEA graduates are at great disadvantage for having poor English skills.
<b>Recommendations</b>	Include English in the basic curriculum. Offer courses of other subjects in English, using English texts. Develop internships.	Establish agreements for the development of professional practices. Closer linkages between the labor market and the classroom.	Language teaching. Internships. International exchanges. More practical curricula.
Source: author's.			

In interviews with experts, there was a more positive performance evaluation of graduates from other universities than from CUCEA. The latter are required especially for lower-level positions. However, the survey of employers reported that for every 4 graduates they hire 3 are from CUCEA and firstly they are required for administrative tasks, secondly for mid-management and thirdly for operational and technical areas.

Performance, measured in surveys of employers, is generally considered good, in an ordinal five choice scale it is right in the middle. CUCEA graduates' collaborative attitude and willingness to learn is widely recognized but their lack of assurance and assertiveness is underlined as a limiting factor for good performance. Employers also note the importance of training students and graduates to show initiative and leadership so that they can take responsibility in solving problems independently. They especially emphasized the need for graduates to write, speak, understand and improve their English writing. These data were also corroborated with information from the interviews.

The main recommendations by experts interviewed for improving graduate performance are two: to become fluent in English (and for this they proposed several mechanisms) and to develop experience through job placements and practical up-to-date subjects. Although various proposals were also mentioned, these came up again and again and are identified as the most important factor in order for graduates to become more competitive in the labor market.

## Requirements of employers

This section is hinged to the previous one, to the extent that performance can improve as long as labor market requirements are adequately met. The analysis presents the views and perceptions of the group of experts interviewed, supplemented with the findings from the surveys of employers. The scheme of the previous section is maintained for comparing and contrasting each interest group's proposals.

There is agreement among the different groups of experts. However, government officials present more general views which presumably show less knowledge of the situation. Recruitment agencies and human resource managers show detailed knowledge, as they have evaluated graduates from all different universities in the area, and also understand well the requirements of different groups of employers. It is important to point out that this last group of experts, is the one that made the worst assessment of CUCEA graduates.

When surveying the employers we found that the majority of them argue that the skills needed to perform well in the labor market are: mastering financial areas, an extensive market knowledge and the management of science and technology. These requirements were also raised in the interviews with experts. They highlighted the knowledge and use of languages other than English, especially for careers in Tourism and International Business. An important aspect that was also pointed out, was to have a multicultural vision that facilitates doing business in different countries. For government officials it is important to have academic credentials and graduate studies, this coincides with the findings in the international literature (Hall, Buchanan and Gillian, 2002).

In this work, the term competences is considered equivalent to what an individual can do and the skills he or she has. In this section, respondents again show almost unanimous agreement, noting especially research, analysis, synthesis and problem solving skills, as well as advanced software skills, as the core skills necessary to perform well in the labor market.

This means that more than knowledge, learning skills are required to be able to self-specialize in short periods of time, so self-study, autonomy and independence are characteristics that should be promoted widely in college. In human terms, some of the most valued skills are the ability to help form and work in teams while having good communication and leadership skills. The universal features for job applicants to be attractive to the prospective employer can be boiled down into two: research applied to problem solving and conflict-solving skills, teamwork and integrating into the organization (García, Ginés and Vila, 2004).

In terms of the attitudes and values reported as being important by the three expert groups, there is an agreement around the values of respect, honesty, ethics and responsibility. An attitude of service and collaboration is also valued, and according to respondents, it is difficult to find these attributes in graduates from private universities. To be open to change is a very important attitude for businesses, while for recruitment agencies and human resource managers competitiveness, assertiveness and being proactive are central.



The analysis shows a high regard of self-motivated, creative, professionals, with new ideas, with no need to be monitored to comply with their objectives and especially the ability of learning to learn. In the knowledge society, knowing what is not known, and identifying interpretive biases that can negatively affect reasoning, along with learning to learn (David and Foray, 2002), will reduce the learning gaps at the individual, group, organizational and social level, to be able to participate as producers and not only consumers of knowledge.

**Table 3. Table 3. Labor Market Requirements**

	Business Association Leaders and Businessmen	Government Officials	Placement Agencies and Human Resource Managers
<b>Knowledge</b>	English language proficiency. Command of up-to-date technology. Detailed expertise and knowledge instead of general and vague. Extensive knowledge: The labor market. Trade agreements and legislation. Up-to-date technology management	English Languages Postgraduate studies (masters).	Fluency in English. Market knowledge. Languages (German, Japanese, Chinese) Extensive knowledge of multiculturalism and its relation to business.
<b>Competences</b>	Experience. Ability to work under great pressure. Team player. Ability to solve problems. Good communication skills. Ability to identify market needs. Multifunctional. Ability to apply knowledge to solve problems. Management of administrative software. Ability to learn to learn. Leadership.	Research capacity. Ability to solve problems. Skills of analysis and synthesis. Ability to undertake projects. Open minded. Reading abilities. Ability to work in a team. The capability to handle advanced information technologies. Experience. Leadership.	Experience. Management of specialized software. Problem solving. Ability to plan. Ability specialize quickly through self-learning. Leadership.
<b>Attitudes and values</b>	Taking the initiative. Willingness to change. Professional Ethics, Responsibility, Respect Tolerance Creativity Sociable Know how to own the vision. Awareness of business needs. Willingness to partner and start from the bottom.  Attitude of service	Commitment Honesty Honor Attitude of service. Willingness to work together.	Ambition Competitive Proactive Proclivity to take risks (venture) Personal Safety Assertiveness
Fuente: Elaboración propia.			

## Future trends

The analysis of labor market trends is based on interviews with groups of experts. This section asked what changes could be expected, particularly in the labor market, for the medium and long term, and therefore, what profile should graduates have in order to successfully enter.

For respondents, the potential impact that the university may have in the development of the region is clear. However, in their view, the necessary conditions for coupling between the university and society to generate the highest returns for the local economy and an improved quality of life have not yet been established.

In this regard, the group of public officials and business people agree that CUCEA as an institution, should be oriented towards training entrepreneurs, and not self-employed graduates which could start-up technology companies for boosting the region's economic dynamism.

The areas where more development is expected in the state are software companies, biotechnology, tourism and agribusiness sectors. As well, opportunities in international markets and businesses are identified. For the software industry and biotechnology extraordinary opportunities have been created in the labor markets of other countries, that are even less developed than Mexico, but the profile is oriented toward gold-collar workers (Won-nacott, 2002a), with an excellent command of English and other languages, knowledge of international markets, with a high capacity to innovate, to keep up-to-date through participation in virtual learning communities that combine knowledge from different areas<sup>2</sup> as well as a strong entrepreneurial orientation.

Agribusiness is another area in which the state may obtain huge advantages when combined with knowledge in management, international business, licensing of patents, and biotechnology. The new biotechnological techniques increase competitiveness, allowing participation in international markets and leveraging regional advantages.

International business management skills involve knowledge of world-class companies, which may be big or small, but with different administrative systems than those traditionally used in the region. The management of high-level human resources (PhDs, engineers, technologists), producing knowledge and innovation and whose coordination and evaluation cannot be assessed through the systems used by traditional management. The management of flexible organizational structures, teamwork, virtual communities and knowledge management are seen in the mid term as essential capabilities for successfully integrating into the labor market.

<sup>2</sup> For example, one of the most valued professionals worldwide in biotechnology companies, universities and research centers is the specialist in bioinformatics, his or her profile is diverse, with knowledge of programming, software development, statistical analysis and biology, particularly genetic sequencing. Some are computer science engineers with majors in biology, others may be doctors in statistics or mathematics with an affinity for life sciences. The possibilities are diverse and the opportunities for such professionals are increasing at high speed (Field Work/April 2006).

In this context, there is a need to form a "hybrid graduate" capable of articulating knowledge from various fields, with good business, science and technology management skills, with knowledge of competitive intelligence, patent validation in international markets, proficient in computer sciences (databases, basic programming) who can successfully solve problems in production areas.

The university has the option and the obligation to become an active participant in this knowledge society, contributing with the training of graduates to configure it, so results may be reflected in the welfare of society as a whole. However, given the situation described, the challenges we face seem to multiply.

## Conclusions

In this paper we presented the results of a descriptive research on labor market perceptions of CUCEA graduates. The analysis was performed identifying four areas of interest: 1. Graduates' distribution, wages and roles in the labor market, 2. A quality and performance assessment of the graduates as professionals, 3. Labor market requirements in terms of knowledge, skills, attitudes and values and, 4. Trends or expected changes observed in the medium and long term which will involve new requirements for graduates.

The results show that the wages earned by CUCEA graduates are below the average wage for the state of Jalisco. Professionals are required for administrative, middle management and operational positions not for senior management. Therefore, their quantitative performance assessment is located at a significant midpoint. Their spirit of service and the ability to start from scratch is appreciated but their lack of initiative and leadership, in addition to their general knowledge were reported to be too theoretical.

Graduates lack of experience is seen as a big problem and a disadvantage compared to graduates from other universities, in addition to their limited English skills. It is particularly emphasized that training should be aimed at developing knowledge capabilities: problem solving, reading, project design, analysis, synthesis, writing, research and self-specialization. It was noted that their most appreciated ability, which synthesizes many of the above is their ability to "learn to learn."

In the knowledge society this capacity is what can make the difference between nations, regions, organizations and individuals. It is essential to identify the gaps at all levels and learn to resolve them quickly, to reduce the gaps through the generation of knowledge of all kinds: basic, applied, technological developments, services, and so on.

What is the university doing to actively participate? How should its programs be oriented? What programs should it offer? What is the role of research? What kind of teachers are needed? What is needed to train graduates who are responsible for their own knowledge and have international projection? What to do to encourage entrepreneurs in high tech business? What

is the student's responsibility? How to generate knowledge communities?

A flexible, knowledge generating institution with a sense of purpose to guide its processes, is essential for articulating society's needs and taking part in the direction of changes towards an economic growth with distributed welfare. A graduate entrepreneur, who is multifunctional, capable of investigating, used to solving challenges and building their own opportunities will become part of this valuable human capital needed to promote a society where knowledge is present in all processes, from the complex to the most common everyday tasks.

In the knowledge society, innovation is a core activity and research becomes the foundation for the creation of new knowledge. However, we have a teaching-oriented university, with an administrative apparatus that makes it very difficult to respond quickly to society's problems, maintaining its own timing and interests, with a vision that leads it to react to environmental changes not to generate them. Graduates are, in as much, the result of this, so we have a huge task ahead of us, which is the shared responsibility of academics, teachers, students, alumni, authorities, and society as a whole.

Three aspects are important in this discussion: 1. Knowledge is a source of economic and social development. 2. Research as knowledge generating, and, 3. The university must generate research and train students and future graduates in research, to boost growth in the region through knowledge.

## References

- ANUIES (2003). *Mercado laboral de profesionistas en México. Escenarios de prospectiva 2000 – 2006 – 2010*, Segunda parte, Serie Investigaciones, México, D.F., ANUIES.
- ANUIES (2003a). *Esquema básico para estudios de egresados*. Serie Investigaciones. México, D.F., ANUIES.
- Arechavala V., R. y C. Díaz (2006). *Mercado de trabajo de los egresados del CUCEA ¿Qué opina la sociedad de ellos?*, Guadalajara, Jal., Unidad de Producción Editorial CUCEA, U. de G.
- Arechavala V., R. y C. Díaz P. (2004). “Sistemas Regionales de Innovación en México y Canadá: Una Comparación de Retos en el Desarrollo de la Innovación Tecnológica”, *Revue Sciences de Gestion*, Núm. 41.
- Coullon, A. ( 2002) “Underemployment Amongst New Zealand Graduates: Reflections from the Lived Experience”, *New Zealand Journal of Industrial Relations* 27 (3), pp. 283-297.
- David, P. y D. Foray (2002). “Fundamentos económicos de la sociedad del conocimiento” *Revista de Comercio Exterior*, 52 (6), 2002.
- Díaz, C., Arechavala, R., Ayala, A., S. Ferrer, B. Jaén, y B. Madrigal (2007). “Reporte descriptivo de las encuestas realizadas a las empresas de software en la ZMG”, *Segundo Seminario interno de trabajo del proyecto CONACYT 45500 Pymes, redes de conocimiento, actividades innovativas y desarrollo local*, México, D.F., UAM Xochimilco.
- Díaz P., C. (2007). “Las empresas de software en la ZMG. Perfiles, políticas públicas y resultados”, *Gaceta Ide@s CONCYTEG* Año 2, Núm. 17, Gobierno del Estado de Guanajuato ([www.concyteg.gob.mx](http://www.concyteg.gob.mx)).
- Fraser, S., D. J. Storey, y P. Westhead (2006). “Student Work Placement in Small Firms: Do They Pay-off or Shift Tastes?”, *Small Business Economics* 26, pp. 125-144.

- García A., A., J. G. Mora y L. E. Vila (2004). "The Rewards of Human Capital Competentes for Young European Higher Education Graduates", *Tertiary Education and Management* (2004) 10, pp. 287-305.
- IMD (2006). *IMD World Competitiveness Yearbook 2006*, Suiza, IMD.
- Hall R., J. Buchanan y C. Gillian (2002), "You Value What You Pay For." *Enhancing employers' Contribution to Skill Formation and Use*, Dusseldorf Skills Forum, Australia, Inc.
- Hassid, J. (2002). *Internationalization and Changing Skills Needs in European Small Firms: Synthesis Report*, CEDEFOP Reference Series.
- Lianos, T.P., D. Asteriou, y G. M. Agiomirgianakis (2004). "Foreign University Graduates in the Greek Labour Market: Employment, Salaries and Overeducation", *International Journal of Finance & Economics* 9 (2), pp. 151-164.
- Lindberg, M. (2007). "At the Frontier of Graduate Surveys' Assessing participation and employability of graduates with master's degree in nine European countries", *Higher Education*, 53, pp. 623-644.
- Leydersdorf, L. y H. Etzkowitz (1998). "The triple helix as a model for innovation", *Science and public policy*, June.
- Mora, J.G., A. García, J. M. Carot y L. E. Vila (2006). "Monetary Rewards and Competentes of Young European Graduates", *Higher Education Management and Policy* 18 (1), pp. 37-53.
- Navarro L., M. A. (2003). "Consideraciones teóricas para el estudio de egresados", En *Esquema Básico para Estudios de Egresados en Educación Superior*. Serie Investigaciones. México, D.F., ANUIES.
- OCDE (2004). *Career Guidance a Handbook for policy Makers*, Francia, OECD Publications.
- OCDE, (2004). *Career Guidance and Public Policy*, Francia, OECD Publications.
- Perrone, L. y M. H. Vickers, M.H. (2003). "Life after graduation as a "very uncomfortable world": an Australian case study", *Education & Training* 45 (2), pp. 69-78.
- Rodríguez S., C. R. (2004). "Inserción laboral de egresados de la educación superior en el estado de Hidalgo", *Revista de la Educación Superior*, 131.
- Ruiz D., C., M. Piore y A. Schrank. (2005) "Los retos para el desarrollo de la industria del software", *Revista de Comercio Exterior*, 55 (9).
- Thurow, L. (1999), "Building wealth", en *Atlantic Monthly*, July.
- U.S. Department of Labor (2004). *Employers pocket guide on youth employment. Youth rules*. USA, Department of Labor.
- Wonnacot, M. E. (2002). *Career passports, portfolios and certificates*. ERIC Digest, ERIC Clearinghouse on Adult Career Passports, Portfolios, and Certificates ([www.eric.ed.gov](http://www.eric.ed.gov)).
- Wonnacott, M. E., (2002a). *Gold-collar workers*. ERIC Digest, ERIC Clearinghouse on Adult Career Passports, Portfolios, and Certificates ([www.eric.ed.gov](http://www.eric.ed.gov)).
- Yuche, J., W. Stewart y R. Bod (2001). "International Business Competencies Needed by Business Graduates in The United States and Taiwan", R.O.C., *Annual Meeting of the American Vocational Education Research Association*, New Orleans.