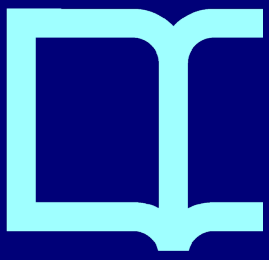

Total Quality Management, 2022
https://doi.org/10.1080/14783363.2022.2029695

Routledge
Taylor & Francis Group

The recruit requirements of recent graduates: approaching the existing mismatch

Maria Pujol-Jover [a*], Lola C. Duque [b] and Maria-Carme Riera-Prunera [c]

[a]*Economics and Business Department, Universitat Oberta de Catalunya, Barcelona, Spain;*
[b]*Department of Business Administration, Universidad Carlos III de Madrid, Madrid, Spain;*
[c]*Econometrics, Statistics and Applied Economics Department, University of Barcelona, Barcelona, Spain*

This paper explores quality perception and expectations in higher education considering 30 competences grouped into three standard sets: instrumental, interpersonal, and professional. Based on the SERVQUAL research model, the authors propose a four-gaps model to compare employers' and graduates' perceptions of the competences required by the labour market and the level of skills achieved after graduation, and examines the existence of discrepancies between them. Our model analyses the uneasy feeling perceived in the labour market due to the existing mismatch between the skills developed by students at university and those that the labour market demands using a higher learning institution. Data were collected by means of a survey conducted among recent graduates in economics, and from managers in companies where those graduates were working. Our findings reveal that graduates are not being taught the specific knowledge that would apparently be useful for successful integration into the labour market on leaving university (gap A). More importantly, graduates seem to lack self-esteem and confidence in their own abilities and knowledge (gap B). In our opinion, this research offers an important contribution to the understanding of skill gaps and contributes to empirical knowledge by identifying the aspects where the main discrepancies lie.

Keywords: perceptions; gap analysis; competences; recent graduates; recruitment requirements; SERVQUAL model; ANOVA test

Introduction

The new competence-based learning model requires modern and meaningful learning tools to allow graduates to develop skills and become active constructors of knowledge, rather than just being passive receivers (Drew, 1998; Duque, 2014). To achieve this objective, the solid acquisition of a range of competences is extremely important, since it facilitates graduates' transition into the labour market (Braun et al., 2012; Boccuzzo & Gianecchini, 2015); Heijke et al. (2003) reinforce this idea, highlighting that the speed at which graduates learn is based on the level and type of skills acquired.

In 2021 a survey revealed that 69% of global employers are experiencing difficulties filling positions within their organisations, the highest value ever since 2006 (ManpowerGroup, 2021). The survey also showed how difficulties increase by company size, so large companies find it twice as difficult to find the appropriate workers as micro companies. Lack of hard and soft skills are reported to be two of the top five drivers of talent shortages. Along the same lines, PricewaterhouseCoopers, one of the big graduate

*Corresponding author. Email: mpujoljo@uoc.edu

recruiters, announced in 2015 that it would remove the UCAS (Universities & Colleges Admission Service) criteria from its employment process in the UK in order to recruit more talented and skilled people (PricewaterhouseCoopers, 2015). Soon after, Ernst & Young and Penguin Random House subscribed to the PwC initiative and scrapped any university degree requirement in all of their entry criteria, deciding they would hire non-traditional candidates based on the fact that 'there's no evidence success at university correlates with achievement in later life' (Elmes, 2016; Havergal, 2015).

In words of Matt Ferguson, CEO of CareerBuilder, 'the gap between the number of jobs posted each month and the number of people hired is growing larger as employers struggle to find candidates to fill positions at all levels within their organizations' (CareerBuilder, 2017). Thus, skill gaps are not confined to certain sectors or occupational categories, but exist across the economy. Jobs go unfilled or take longer than the desired time to fill, and skill sets fail to match employer needs, which bring into question the value of the degree. Dr Senthil Nathan (2018) cited 'skill gaps as the major reason for difficulties in filling vacancies over a long period' and stated that 'employers also see this issue as a major threat to their business growth'.

Thus, the question we have as researchers is, do companies perceive differences in the level of competences intended/acquired and desired/required? If the answer is yes, there are major implications for university management. Higher Education Institutions (HEIs) cannot afford to lose the role of providing appropriate skills to their graduates in line with the continual pursuit of social improvement. It is necessary to understand labour demand and identify job placement trends, and according to that, find ways to help graduates succeed in their future careers and fill the skills gap. Therefore, the aim of this investigation is to answer the following two research questions:

RQ1: Where is the mismatch between the competences students acquire at university and those required at work?

RQ2: Which competence gaps rank at the top of the mismatches?

Conceptual framework

A fast-growing research stream in HEIs is service quality, where competitive advantage can be gained through providing better services (Abdullah, 2006; Marimon et al., 2017). Higher education is a service where students are key clients, the secondary customers being the firms hiring the graduates, and as such quality must be constantly supervised and improved to keep pace with customers' demand and meet persistently growing quality standards. Consequently, HEIs increasingly consider quality as an internal goal (Sultan & Yin Wong, 2012). Due to the need to analyse service quality, various frameworks have been developed, the basic ones being Total Quality Management (TQM), with the leading contribution made by Powell (1995) and the SERVQUAL (SERVice QUALity) model proposed by Parasuraman et al. (1985) in the marketing area.

The SERVQUAL model is based on discrepancies or gaps identified when assessing service performance, the most relevant being the difference customers see between what they expected and what they finally perceived from the service delivery. This main gap between expectations and performance as observed by a client is the result of the four remaining gaps: lack of knowledge of the other party's expectations, service specifications as understood by the employees, different communication methods, and resources available to deliver the service. The model lets us identify the problems appearing in the service provision process, and similar gaps can be assessed in higher education services

from various stakeholder perspectives (graduates, employers, faculty members, students' families, government, public policymakers, etc.) to better show the extent of the mismatch (Wolniak & Skotnicka-Zasadzien, 2012).

Taking this into account, the model has been applied in the higher education context – as reviewed by Zafiropoulos and Vrana (2008) – for different purposes: comparing the perceptions and expectations of graduates and faculty, comparing other stakeholders' and employers' perspectives, developing specific measures for postgraduate programmes, etc. According to previous research, the SERVQUAL model may provide useful information to improve the provision of education (Calvo-Porral et al., 2013; Chatterjee et al., 2009; Cheruiyot & Maru, 2013). Some of the studies focus on the main gaps, whereas others concentrate on defining the perceived quality of the dimensions that are relevant in the analysis. Firdaus (2006), for instance, identifies six service quality dimensions that are relevant in higher education. Hanaysha et al. (2012) use the model to analyse the satisfaction level of graduates and employers with universities, Pradela (2015) evaluates graduates' preparation level, and Lupo (2013) measures the quality of higher education. It has also proven a useful tool for evaluating educational processes by identifying strengths and weaknesses, and for analysing service quality in higher education (Tan & Kek, 2004).

The analysis conducted in this study is inspired by the SERVQUAL model. Minor changes were required to adapt the SERVQUAL to our research framework built on the philosophy of TQM in order to map student expectations against perceptions and identify service quality gaps (Barnes, 2007). It should be noted that this paper does not focus on perceived quality, namely the 'service process', but rather explores the 'service outcome' based on the competences acquired by graduates[1] and analyses the existing gaps between companies' and graduates' perceptions. All the statements were designed to ask students and firms about their expectations and perceptions.

Our proposed conceptual model, displayed in Figure 1, considers four gaps:

Gap A relates to the competences employers observe, compared to what they expect to find. Gap B captures what graduates believe is the level of competences acquired during their studies, compared to the level companies expect to find. Gap C takes into account both perspectives and conducts the related pair analysis in terms of expectations (competences required at work). Finally, Gap D focuses on the level of competences displayed at

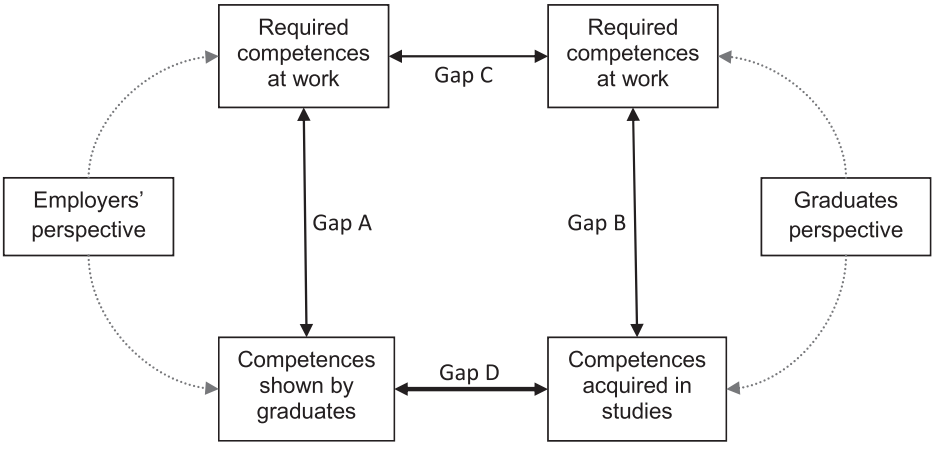

Figure 1. Framework for competences gap analysis. Note: Gaps A, B, C, and D will be exposed later.

work. This last gap is quite revealing, since it shows the direct assessment of competence perception.

Methodology

In this research, a quantitative methodology was applied and two parallel surveys were conducted during six months (from April to September 2018) among recent graduates and their employers to assess the perception of university graduates and employers of several core competences.[2] Following Pagani (2009), competences were categorised into instrumental, interpersonal, and professional (systemic) types, as suggested in the Tuning Educational Structures in Europe project.[3] Although there are other classification criteria (e.g. García-Aracil & Van der Velden, 2008; Guerrero & de los Ríos, 2012), the Tuning taxonomy meets the objective of covering the spectrum of generic capabilities needed throughout one's working life:

- Instrumental competences encompass basic aspects that facilitate workers' professional performance. They define cognitive, methodological, technological, and linguistic abilities (capacity to analyse and summarise, computer skills, problem solving, etc.)
- Interpersonal competences relate to individual and social skills that intensify cooperation and social interaction processes (critical and self-critical capacity, ability to work in teams, ethical commitment, etc.)
- Systemic competences refer to the integration of cognitive abilities and practical skills, and allow the person to adapt their knowledge to a professional environment (learning ability, creativity, or setting oneself high standards).

One of the surveys targeted graduates with two to five years' work experience who had attended the Faculty of Economics and Business at a large Spanish university. The other survey targeted companies included in the university's corporate database which had hired at least one economics and business graduate in the previous five years, either as a trainee or as a staff member. The businesses in the survey represented retail, wholesale, manufacturing, and service sectors.

Before conducting the survey, and in order to guarantee the quality of the instrument, surveys were pre-tested by a smaller group of both graduates and employers (Dillman, 2000). After their feedback, the surveys were refined and both groups were asked the same sets of questions related to instrumental (11), interpersonal (6), and professional (13) competences. All of them are directly linked to the student's programme learning outcomes of the university's Faculty curriculum. Graduates and employers were also asked additional questions to contextualise their responses.

The surveys were implemented and distributed using online survey software. From 5155 questionnaires sent to graduates and 2384 sent to employers, 282 and 238 responses were received, correspondingly. After checking for completeness our final sample is composed of 239 surveys from graduates (4.6%) and 183 from employers (7.7%). Following 1977 Cochran's formula and preserving the assumption of maximum indeterminacy ($p = q = 0.5$) and a 95% confidence level, the sample allowed for a 5.2% error in the graduates' estimates and a 5.8% error in the employers' estimates. Similarly, fixing a 5% margin of error, the confidence levels would be 94.3% for graduates and 92.0% for employers. In line with some authors, such as Sax et al. (2003) or Eaton et al. (2011), it was assumed that individuals who answered came from a representative sample of their corresponding

groups. The surveys sent to graduates and companies were anonymous; thus it is believed that no other type of bias is present, except for the non-response bias, as usual in most survey studies (e.g. Lefever et al., 2007; Nulty, 2008).

The surveys assessed each competence using a quantitative Likert scale ranging from 1 to 6, 1 being the lowest and 6 being the highest perception. Employers were asked to rate both the required level of each competence and the level shown by the graduates at work (see columns 1 and 2 in Table 1). Graduates were asked to rate the level at which each competence was required by their employer, as well as the competence acquisition level during their studies (see columns 3 and 4 in Table 1).

The graduates' sample consisted of 38.9% males and 61.1% females, whereas in the employers' sample 44.8% of the total were males and 55.19%, females. In terms of work position, 41.2% of employers' respondents were managers, 34.1% middle managers, and 24.7% employees. Of the employers sampled, 7.7% had completed secondary school, 65.4% had a university degree, and 26.9% had completed a master's or doctoral degree.

The gap analysis was performed using the Statistical Package for Social Science (SPSS 25) and the effect size was calculated using R and R Studio. The ANOVA test was used to evaluate the existing discrepancies between employers' and graduates' perceptions, and also to capture the opinion of each group with regard to performance versus expectations.[4] In line with quantitative methods and marketing literature recommendations (Ellis, 2010; Rossiter, 2002), effect sizes were calculated (Hedges, 1981; Fritz et al., 2012) and consistency for the three sets of competences was checked (Cronbach, 1951). Complementing ANOVA test and as measures of the power of discrepancies, two different measures of the effect size were calculated for each gap under analysis. Cohen (1988) recommends Eta-squared for ANOVA test and Hedges' g effect size measure in a general independent mean comparison scenario. As Eta-squared is based on the explained variance of the sample, and not on the population, it overestimates the effect size, thus Hedges' g criteria was preferred. Following Hedges' g effect size criterion, each gap could be grouped into four potential categories: no effect (from 0 to 0.154), low (from 0.155 to 0.444), medium (from 0.445 to 0.744), and strong (larger than 0.744).

Results

In order to gain a broader view of all competences (Álvarez-González et al., 2017), three indices[5] have been built, one for each set of competences. Each index is calculated as the mean value of the graduates' and employers' skills perceptions involved in the specific set. To ensure the consistency of these indices, the Cronbach alpha values of each set were calculated (see Table 2). All three values were above 0.80, implying that competences are highly related within each set and that the sets are consistent.

According to these overall indices, the general competence assessment by employers is close to 4.1 points (on a 1–6 Likert scale). However, the graduates assess them at around 3.5. These values reinforce the idea, outlined earlier, that graduates seem to assign lower value to knowledge, skills, and capabilities developed during their studies. On the other hand, as both the employers' and graduates' indices for the required competences rank 4.7, both collectives believe that employees should be more skilled than they are.

Next we focus on the gap[6] analysis by type of competence. The gap results are structured into four categories according to the gaps analysed (see Table 2). For each set of competences, the most relevant discrepancies[7] are detailed based on the statistically significant differences, and ranked by gap and Hedges' g effect size.

Table 1. Assessment of employers' and graduates' perceptions.

GAP D					Employers		Graduates		GAP A			GAP B			GAP C	
Competences[(i)]	Req. (1)	Obs. (2)	Req. (3)	Obt. (4)	Diff. (5)	Eta2 (6)	|Hedges' g| (7)	Diff. (8)	Eta2 (9)	|Hedges' g| (10)	Diff. (11)	Eta2 (12)	|Hedges' g| (13)	Diff. (14)	Eta2 (15)	|Hedges' g| (16)
1. Analysis and synthesis	4.8	4.1	4.9	4.1	0.7***	***0.1***	***0.8***	0.8***	*0.1*	***0.7***	−0.1	n.c.	n.c.	0.0	n.c.	n.c.
2. Organisation and planning	5.0	4.1	5.2	4.1	0.9***	*0.0*	***1.0***	1.1***	*0.1*	***1.0***	−0.2	n.c.	n.c.	0.0	n.c.	n.c.
3. General basic knowledge	4.5	4.2	4.2	4.2	0.3***	***0.1***	*0.3*	0.0***	***0.1***	0.0	0.3	n.c.	n.c.	0.0	n.c.	n.c.
4. Specific degree knowledge	4.4	4.2	4.0	4.0	0.2***	***0.2***	*0.2*	0.0***	*0.0*	0.0	0.4*	*0.0*	*0.4*	0.2	n.c.	n.c.
5. Foreign language knowledge	4.2	3.7	4.4	1.9	0.5***	***0.1***	*0.4*	2.5	n.c.	n.c.	−0.2	n.c.	n.c.	1.8*	*0.0*	***1.4***
6. Computer skills	4.8	4.3	5.1	2.8	0.6***	***0.2***	***0.6***	2.3	n.c.	n.c.	−0.3	n.c.	n.c.	1.5	n.c.	n.c.
7. Responsibility and decision making	4.9	3.7	5.0	3.4	1.1**	*0.0*	***1.0***	1.6	n.c.	n.c.	−0.2	n.c.	n.c.	0.3	n.c.	n.c.
8. Problem solving	5.2	4.0	5.0	3.5	1.2**	*0.0*	***1.3***	1.6	n.c.	n.c.	0.1	n.c.	n.c.	0.5	n.c.	n.c.
9. Information management	5.0	4.4	4.8	3.8	0.6***	***0.1***	***0.6***	1.0**	*0.0*	***0.9***	0.2	n.c.	n.c.	0.6	n.c.	n.c.
10. Catalan and/or Spanish oral communication	5.1	4.8	5.1	3.9	0.2***	***0.2***	*0.3*	1.2***	*0.0*	***0.9***	−0.1	n.c.	n.c.	0.9	n.c.	n.c.
11. Catalan and/or Spanish written communication	5.1	4.6	5.0	4.1	0.5***	***0.1***	*0.5*	0.9***	***0.1***	***0.8***	0.0	n.c.	n.c.	0.5	n.c.	n.c.
Instrumental	4.8	4.2	4.8	3.6	0.6***	***0.1***	***0.6***	1.2***	*0.0*	***0.9***	0.0**	0.0	0.0	0.6*	0.0	*0.5*
1. Business ethics	5.0	4.4	3.9	3.0	0.6***	***0.1***	***0.6***	0.9***	***0.1***	***0.6***	1.1	n.c.	n.c.	1.4	n.c.	n.c.
2. Ability to pass on knowledge	4.5	3.8	4.5	3.5	0.7***	***0.1***	***0.7***	1.1***	*0.0*	***0.9***	0.0	n.c.	n.c.	0.4	n.c.	n.c.
3. Critical and self-critical ability	4.6	3.8	4.4	3.7	0.8**	*0.0*	***0.8***	0.7***	*0.0*	***0.6***	0.1	n.c.	n.c.	0.1	n.c.	n.c.
4. Team work	5.1	4.4	5.0	3.3	0.7**	*0.0*	***0.7***	1.7**	*0.0*	***1.4***	0.1	n.c.	n.c.	1.1	n.c.	n.c.
5. Negotiating skills	4.5	3.5	4.6	2.7	0.9***	***0.1***	***0.8***	1.9	n.c.	n.c.	−0.2	n.c.	n.c.	0.8	n.c.	n.c.
6. Appreciation of multiculturalism	4.2	4.2	3.6	3.1	−0.1***	***0.2***	0.1	0.5***	***0.1***	*0.3*	0.5	n.c.	n.c.	1.1	n.c.	n.c.
Interpersonal	4.6	4.0	4.3	3.2	0.6***	***0.1***	***0.6***	1.1***	*0.0*	***0.8***	0.3*	0.0	*0.2*	0.8	n.c.	n.c.
1. Ability to adapt to new situations	5.2	4.3	5.2	3.5	0.9**	*0.0*	***1.0***	1.6***	*0.0*	***1.5***	0.0	n.c.	n.c.	0.8***	*0.0*	***0.7***
2. Capacity to learn	5.4	4.8	5.2	4.3	0.6***	*0.1*	***0.8***	0.8***	***0.1***	***0.8***	0.2	n.c.	n.c.	0.4	n.c.	n.c.
3. Creativity	4.6	3.9	4.3	3.0	0.7***	***0.1***	***0.6***	1.3***	*0.1*	***1.0***	0.3*	*0.0*	*0.2*	0.9	n.c.	n.c.
4. Initiative and entrepreneurship	5.0	3.9	4.7	3.1	1.1***	*0.0*	***1.0***	1.6	n.c.	n.c.	0.2	n.c.	n.c.	0.8	n.c.	n.c.
5. Being self-demanding and success motivated	5.0	4.1	4.9	3.6	1.0***	*0.0*	***1.0***	1.3**	*0.0*	***1.1***	0.2	n.c.	n.c.	0.5	n.c.	n.c.

6. Knowledge application in practice	4.8	4.1	4.8	3.0	0.7***	***0.1***	***0.8***	1.7	n.c.	n.c.	0.0	n.c.	n.c.	1.0	n.c.	n.c.
7. Economic vocabulary use and reasoning	4.2	4.0	4.3	4.1	0.2***	***0.2***	0.2	0.2**	*0.0*	0.2	−0.1	n.c.	n.c.	−0.1*	*0.0*	0.1
8. Conclude and interpret results	4.9	4.0	5.0	4.0	0.9**	*0.0*	***0.9***	1.0*	*0,0*	***0.9***	−0.1	n.c.	n.c.	0.0	n.c.	n.c.
9. Ability to produce technical reports	4.5	3.9	4.6	3.0	0.7***	***0.1***	***0.6***	1.6***	*0.0*	***1.2***	−0.1	n.c.	n.c.	0.8	n.c.	n.c.
10. Ability to work under pressure	4.9	3.7	5.3	3.5	1.2***	***0.1***	***1.1***	1.8*	*0.0*	***1.4***	−0.4	n.c.	n.c.	0.2	n.c.	n.c.
11. Ability to impose authority	3.6	3.2	3.8	2.5	0.4***	***0.2***	*0.3*	1.3***	***0.1***	***1.0***	−0.2	n.c.	n.c.	0.8	n.c.	n.c.
12. Autonomous work ability	4.9	4.0	4.9	4.2	0.9***	*0.1*	***0.9***	0.7***	*0.1*	***0.7***	−0.1*	*0.0*	0.1	−0.2	n.c.	n.c.
13. Leadership	4.2	3.6	4.4	2.9	0.6***	***0.1***	***0.6***	1.5	n.c.	n.c.	−0.2	n.c.	n.c.	0.7	n.c.	n.c.
Professional/Systemic	4.7	3.9	4.7	3.4	0.7***	***0.1***	***0.7***	1.3***	*0.1*	***1.0***	0.0	n.c.	n.c.	0.5	n.c.	n.c.
TOTAL	4.7	4.1	4.7	3.5	0.7***	***0.1***	***0.6***	1.2***	*0.0*	***0.9***	0.0	n.c.	n.c.	0.6*	0.0	*0.5*

[(i)]Competences are taken from http://www.kent.ac.uk/careers/sk/skillsmenu.htm.

Notes: Mean differences, ANOVA, effect size and competence index. Italics text shows small effect size; Bold and italics text shows intermediate effect size; Grey Shaded bold and italics text shows strong effect size.

n.c stands for not calculated effect size as corresponds to non-significant difference at least at 10% level.

*Shows if the difference is significant at 10% level.

**Shows if the difference is significant at 5% level.

***Shows if the difference is significant at 1% level.

Table 2 Cronbach alpha for skills sets.

	Employers		Graduates	
Competences	Req.	Obs.	Req.	Obt.
Instrumental	0.830	0.870	0.816	0.822
Interpersonal	0.759	0.757	0.733	0.867
Professional	0.864	0.923	0.870	0.892

Employers' perceptions (gap A)

Column 5[8] in Table 1 shows the divergence between the abilities required for the job and what companies perceive graduates' current level of competences to be. Columns 6 and 7 present the power of these discrepancies through the effect size measurement.

The competences presenting the strongest Hedges' g effect size are problem-solving, responsibility and decision making (*instrumental*), work under pressure, initiative and entrepreneurship, having a drive to succeed, adapting to new situations, obtaining conclusions and interpreting results, and autonomous work ability (*professional*).

It is worth mentioning that there is a unique ability that employers perceive as overachieved by graduates, namely appreciation of multiculturalism. However, it has no effect size. Also, for all 30 abilities, the companies believe that further development is needed, as all gaps present statistical significance of at least 5%.

Graduates' perceptions (gap B)

Columns 8, 9, and 10 in Table 1 show the differences perceived by graduates between the levels of competences required and those achieved[9] and the related effect sizes. The authors find that there is a considerable effect on oral communication, organisation and planning, and information management (*instrumental*); teamwork and ability to pass on knowledge (*interpersonal*); and work under pressure, ability to adapt to new situations, draft technical reports, drive to succeed, creativity, ability to impose authority, draw conclusions and interpret results, and capacity to learn (*professional*).

The breadth of these discrepancies caught the authors' attention, suggesting that either graduates are being too demanding in their self-assessment or that there is some problem with the importance given to these competences during their studies. Next, *Gap C* will allow us to go deeper into the most likely reason for this undervaluation.

Comparing perceptions of 'required competences' at work (gap C)

Columns 11, 12, and 13 in Table 1 illustrate the discrepancies and effect sizes between employers' and graduates' perceptions with respect to skills required at work. The comparison serves as a control measurement.

Only three competences exhibit a certain level of disparity (significant at 10% level), meaning that both groups are quite close in their perceptions, and have an associated low effect size: specific degree knowledge, creativity, and autonomous work. Graduates perceive the first two competences as being required at a lower level than they had achieved. Consequently, it may be useful to conduct further research into this aspect. Both the relatively low values of the divergences and the fact that only one of them is significant in favour of the graduates balances the negative perception students had of companies being more demanding than they really were (*gap B*).

Comparing perceptions of what employers observe and what graduates believe they have achieved (gap D)

Finally, *Gap D* tells us that *instrumental* competences have a low effect size, the worst perception with strong effect size being concentrated on foreign language ability.

The disparities between what companies observe and the level graduates perceive as achieved (last three columns in Table 1) are quite explanatory. Focusing on the significant disparities, in the *instrumental* competences set, the unique skill with a significant discrepancy (10% level) and a strong effect size is foreign language. In the *professional* competences set, the gaps are concentrated in the ability to adapt to new situations (1% level and medium effect size) and economic vocabulary (10% level with no effect size). Employers observe greater foreign language knowledge and higher adaptation ability than graduates assess.

Discussion

The purpose of this paper was to study the adequacy of skills in the higher education process, based on the perceptions of the main participating agents. The SERVQUAL-based analysis provided information on how graduates' training matches the labour market, thus, proving useful for evaluating the education process through analysing and identifying strengths and weaknesses.

The first research question of our investigation focuses on the existence of a skills mismatch. Overall, the results indicate that all competences analysed are underachieved by students. The implications of these results are important. In particular, the differences between employers' and graduates' perceptions indicate that graduates often lack a certain amount of knowledge that would apparently be useful for successful integration into the labour market on leaving university (*gap A*). In this sense, employers seem to demand greater effort to strengthen both individual and collective skills, as well as more practically oriented learning, which prioritises competences such as planning and problem-solving or initiative. However, although companies consider that graduates should be acquiring a higher level of competences at university, they positively assess the current level of capabilities graduates show at work (*gap D*). This reinforces the results arising from *gap B*, which show the negatively biased perception graduates have of their level of skills in comparison with the requirements of the workplace, suggesting that they believe the level of competences required is higher than it really is, which is in line with the findings of Drew (1998). The graduates' self-assessment shows the greatest divergences, suggesting a certain lack of self-esteem and confidence in their abilities and knowledge after finishing their studies, as found, for instance, by Braun and Brachem (2015) and Conchado et al. (2015). An alternative explanation is that graduates who have been working for a few years tend to score their own competences low, because they have experienced what the workplace really demands (Gajderowicz et al., 2014; Tabatabaei & Gardiner, 2012; Wickramasinghe & Perera, 2010); whereas, on the contrary, recent graduates tend to score their own competences higher, as they do not have this experience (Scott, 2014).

It is interesting to note that the figures revealed in *gap C*, with close values for discrepancies between employers' and graduates' perceptions of the required competences, broadly suggest that both groups have a similar perception of the abilities, skills, and knowledge needed in the labour market. The fact that graduates seem to be more closely aligned with labour market demands than with the acquisition of a solid base of general knowledge is nothing more than a consequence of an interest in the requirements of their work, which can ultimately be detrimental to the whole training of graduates.

Regarding the second research question: which competences rank at the top of the mismatches? This paper reveals that major gaps, according to the required level at work, correspond to work under pressure, problem solving, decision making, initiative, motivation, organisation, interpreting results, adaptation, autonomous work, and being critical. On the contrary, minor gaps are concentrated in oral communication and basic and specific knowledge.

Overall, these results provide an interesting overview, which confirms the problems stated by most firms in recent last years. In 2021, the Annual Talent Shortage Survey conducted yearly by the Manpower Group around the world pointed out that for 69% of the employers surveyed it had been hard to find suitably skilled employees in the last decade. Graduates seem to be somehow conscious of that, since they consider that the curriculum did not allow them to acquire most of the competences they need at an appropriate level.

Here, our results show the need to develop more effective teaching and assessment methods to achieve particular student learning outcomes. Based on these specific case results, the recommendations would centre on finding and implementing the best procedures and strategies to close the main gaps. Nevertheless, an important pending task for academia, as discussed by Bürgermeister et al. (2016), is to work on reinforcing graduates' confidence in the skills and capabilities they have already acquired. Continuous re-evaluation and sharing responsibilities are two fundamental issues for the higher education sector. Academic programmes (where competences are designed, as well as their assessment strategies) must be fit for the present and future needs of society. Furthermore, companies should also play an active role by working together with university managers to design strategies, methodologies, and content. In essence, close collaboration between businesses and academia is desirable for graduates to receive the best possible training to help improve their employability, something that will later prove essential for their career success (van Dierendonck & van der Gaast, 2013; Álvarez-González et al., 2017). As stated by Bullard et al. (2014), university curricula should prepare graduates for the labour market by providing them with the knowledge, skills, abilities, and behaviour to meet the needs not only of future employers, but also of society at large.

In brief, this paper points out that there is room for improvement in the learning process of graduates. It also highlights the importance of universities performing self-evaluation to locate the gaps and address them. Despite the contribution of this paper, since it is only an explorative work, some limitations that might have affected our results should be mentioned. Further research into this topic may help universities to outline practical implications and priorities regarding competence development. A precise ranking of required skills by fields of study and positions (job analysis) as well as by economic areas would be fruitful to better tackle the problem and address the appropriate solutions. But skills will also vary according to different cultures, and the economic structure of each country as well. Consequently, the skills gap issue must be addressed jointly from all sides. Similarly, the model should be improved to make comparisons among different areas feasible.

Notes

1. The competences used in this study are taken from the Careers and Employability Services of several universities following the Tuning classification widely accepted among academia.
2. The detailed sampling design of the survey is summarized in Alcañiz et al (2013).
3. *Tuning Educational Structures in Europe* is a project that links the objectives of the Bologna Process and the Lisbon Strategy to the higher educational sector, and seeks to re-design,

develop, implement, evaluate, and enhance quality. For more information visit http://www.unideusto.org/tuningeu/

4. Significance levels were set to 0.01, 0.05, and 0.10 and variances between the two groups were assumed unequal.
5. See last row of Table 2.
6. *Gaps A* and *B* are significant at 1% level globally and for the three sets of skills under analysis. *Gap C* is significant at 5% level for the *instrumental* set of competences, at 10% for the *interpersonal* set and non-significant for the *professional* group and the aggregate. Finally, *gap D* presents only statistical significance at 10% for the *instrumental* abilities set and the *total*.
7. Those discrepancies are the variables under analysis.
8. Superscripts indicate whether the difference is statistically significant or not.
9. The current level of graduates' competences is considered as the level acquired at university. Further aspects such as learning by doing, experience in the workplace or life-long learning are not taken into account, since they go beyond the scope of the study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The authors would like to thank the financial help obtained from Universitat de Barcelona [grants number REDICE18-2221, REDICE20-2600] through the Institute for Professional Development (IDP-ICE).

ORCID

Maria Pujol-Jover http://orcid.org/0000-0003-1527-2087
Lola C. Duque http://orcid.org/0000-0003-2301-9030
Maria-Carme Riera-Prunera http://orcid.org/0000-0001-5784-2231

References

Abdullah, F. (2006). Measuring service quality in higher education: HEdPERF versus SERVPERF. *Marketing Intelligence & Planning*, *24*(1), 31–47. https://doi.org/10.1108/02634500610641543

Alcañiz, M., Riera-Prunera, M. C., & Claveria, O. (2013). La formació competencial dels llicenciats en economia i empresa: Una visió des del seu entorn professional. *Revista d'Innovació i Recerca en Educació*, *6*(2), 64–85. https://doi.org/10.1344/reire2013.6.2625

Álvarez-González, P., López-Miguens, M. J., & Caballero, G. (2017). Perceived employability in university students: Developing an integrated model. *Career Development International*, *22*(3), 280–299.https://doi.org/10.1108/CDI-08-2016-0135.

Barnes, B. R. (2007). Analysing service quality: The case of post-graduate Chinese students. *Total Quality Management & Business Excellence*, *18*(3), 313–331. https://doi.org/10.1080/14783360601152558

Boccuzzo, G., & Gianecchini, M. (2015). Measuring young graduates' job quality through a composite indicator. *Social Indicators Research*, *122*(2), 453–478. https://doi.org/10.1007/s11205-014-0695-6

Braun, E., Woodley, A., Richardson, J. T. E., & Leidner, B. (2012). Self-rated competences questionnaires from a design perspective. *Educational Research Review*, *7*(1), 1–18. https://doi.org/10.1016/j.edurev.2011.11.005

Braun, E. M. P., & Brachem, J. (2015). Requirements higher education graduates meet on the labor market. *Peabody Journal of Education*, *90*(4), 574–595. https://doi.org/10.1080/0161956X.2015.1068086

Bullard, S. H., Stephens Williams, P., Coble, T., Coble, D. W., Darville, R., & Rogers, L. (2014). Producing society-ready foresters: A research-based process to revise the curriculum at

Stephen F. Austin state university. *Journal of Forestry*, *112*(4), 354–360. https://doi.org/10.5849/jof.13-098

Bürgermeister, A., Ringeisen, T., & Raufelder, D. (2016). Fostering Students' moderation competence: The interplay between Social relatedness and perceived competence. *Teaching in Higher Education*, *21*(8), 990–1005. https://doi.org/10.1080/13562517.2016.1209183

Calvo-Porral, C., Lévy-Mangin, J. P., & Novo-Corti, I. (2013). Perceived quality in higher education: An empirical study. *Marketing Intelligence & Planning*, *31*(6), 601–619. https://doi.org/10.1108/MIP-11-2012-0136

CareerBuilder. (2017, April 13). The skills gap is costing companies nearly $1 Million annually, according to New CareerBuilder survey. *CareerBuilder Newsroom*. http://press.careerbuilder.com/2017-04-13-The-Skills-Gap-is-Costing-Companies-Nearly-1-Million-Annually-According-to-New-CareerBuilder-Survey

Chatterjee, A., Ghosh C., & Bandyopadhyay, S. (2009). Assessing students' rating in higher education: A SERVQUAL approach. *Total Quality Management & Business Excellence*, *20*(10), 1095–1109. https://doi.org/10.1080/14783360903247114

Cheruiyot, T. K., & Maru, L. C. (2013). Service quality and relative performance of public universities in east Africa. *The TQM Journal*, *25*(5), 533–546. https://doi.org/10.1108/TQM-11-2012-0103

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Conchado, A., Carot, J. M., & Bas, M. C. (2015). Competencies for knowledge management: Development and validation of a scale. *Journal of Knowledge Management*, *19*(4), 836–855. https://doi.org/10.1108/JKM-10-2014-0447

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/BF02310555

Dillman, D. A. (2000). *Mail and internet surveys: The tailored design* (2nd ed.) John Wiley.

Drew, S. (1998). Students' perceptions of their learning outcomes. *Teaching in Higher Education*, *3*(2), 197–217. https://doi.org/10.1080/1356215980030206

Duque, L. C. (2014). A framework for analysing higher education performance: Students' satisfaction, perceived learning outcomes and dropout intentions. *Total Quality Management & Business Excellence*, *25*(1-2), 1–21. https://doi.org/10.1080/14783363.2013.807677

Eaton, D. K., Brener, N. D., Kann, L., Roberts, A. M., Kyle, T. M., Flint, K. H., & Ross, A. L. R. (2011). Computer availability and principals' perceptions of online surveys. *Journal of School Health*, *81*(7), 365–373. https://doi.org/10.1111/j.1746-1561.2011.00604.x

Ellis, P. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. Cambridge University Press.

Elmes, J. (2016). Penguin Random House removes degree requirement for job applicants. *Times Higher Education: World University Rankings*. https://www.timeshighereducation.com/news/penguin-random-house-removes-degree-requirement-job-applicants

Firdaus, A. (2006). The development of HEdPERF: A new measuring instrument of service quality for the higher education sector. *International Journal of Consumer Studies*, *30*(6), 569–581. https://doi.org/10.1111/j.1470-6431.2005.00480.x

Fritz, C. O., Morris, P. E., & Richler, J. J. (2012). Effect size estimates: Current use, calculations, and interpretation. *Journal of Experimental Psychology: General*, *141*(1), 2–18. https://doi.org/10.1037/a0024338

Gajderowicz, T., Grotkowska, G., & Wincenciak, L. (2014). Graduates' job satisfaction across domains of study. *International Journal of Manpower*, *35*(4), 470–499. https://doi.org/10.1108/IJM-05-2013-0109

García-Aracil, A., & van der Velden, R. (2008). Competencies for young European higher education graduates: Labor market mismatches and their payoffs. *Higher Education*, *55*(2), 219–239. https://doi.org/10.1007/s10734-006-9050-4

Guerrero, D., & de los Ríos, I. (2012). Professional competences: A classification of international models. *Social and Behavioral Sciences*, *46*, 1290–1296.

Hanaysha, J. R. M., Dileep, K., & Hilman, H. (2012). Service quality and satisfaction: Study on international students in universities of north Malaysia. *International Journal of Research in Management*, *2*(3), 116–133.

Havergal, C. (2015, August 3). Ernst and young drops degree classification threshold for graduate recruitment. *Times Higher Education: World University Rankings*. https://www.

timeshighereducation.com/news/ernst-and-young-drops-degree-classification-threshold-graduate-recruitment

Hedges, L. V. (1981). Distribution theory for glass's estimator of effect size and related estimators. *Journal of Educational Statistics*, *6*(2), 106–128. https://doi.org/10.3102/10769986006002107

Heijke, H., Meng, C., & Ris, C. (2003). Fitting to the job: The role of generic and vocational competencies in adjustment and performance. *Labour Economics*, *10*(2), 215–229. https://doi.org/10.1016/S0927-5371(03)00013-7

Lefever, S., Dal, M., & Matthíasdóttir, A. (2007). Online data collection in academic research: Advantages and limitations. *British Journal of Educational Technology*, *38*(4), 574–582. https://doi.org/10.1111/j.1467-8535.2006.00638.x

Lupo, T. (2013). A fuzzy ServQual based method for reliable measurements of education quality in Italian higher education area. *Expert Systems with Applications*, *40*(17), 7096–7110. https://doi.org/10.1016/j.eswa.2013.06.045

ManpowerGroup. (2021). *Manpowergroup's annual talent shortage survey*. https://go.manpowergroup.com/talent-shortage#thereport

Marimon, F., Mas-Machuca, M., Berbegal-Mirabent, J., & Llach, J. (2017). Univqual: A holistic scale to assess student perceptions of service quality at universities. *Total Quality Management & Business Excellence*, *30*(1-2), 184–200. https://doi.org/10.1080/14783363.2017.1302795

Nathan, S. (2018, April 16). Many sides of skills gap issue – What the universities can and cannot do. *EDU Alliance Journal*, https://edualliancegroup.blog/2018/04/16/many-sides-of-skills-gap-issue-what-the-universities-can-and-cannot-do/

Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education*, *33*(3), 301–314. https://doi.org/10.1080/02602930701293231

Pagani, R. (2009). Una introducción a Tuning Educational Structures in Europe. La contribución de las universidades al proceso de Bolonia. Publicaciones de la Universidad de Deusto.

Parasuraman, A., Zeithaml, V. Z., & Berry, L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, *49*(3), 41–50. https://doi.org/10.1177/002224298504900403

Powell, T. C. (1995). Total quality management as competitive advantage: A review and empirical study. *Strategic Management Journal*, *16*(1), 15–38. https://doi.org/10.1002/smj.4250160105

Pradela, A. (2015). Quality of graduates' preparation for labour market – a ServQual analysis. *Procedia – Social and Behavioral Sciences*, *174*, 1671–1677. https://doi.org/10.1016/j.sbspro.2015.01.820

PricewaterhouseCoopers. (2015, May 4). Pwc scraps UCAS points as entry criteria for graduate jobs. *PricewaterhouseCoopers Press Room*. https://pwc.blogs.com/press_room/2015/05/pwc-scraps-ucas-points-as-entry-criteria-for-graduate-jobs.html

Rossiter, J. R. (2002). The C-OAR-SE procedure for scale development in marketing. *International Journal of Research in Marketing*, *19*(4), 305–335. https://doi.org/10.1016/S0167-8116(02)00097-6

Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education*, *44*(4), 409–432. https://doi.org/10.1023/A:1024232915870

Scott, B. (2014). Graduate attributes and talent perceptions: Reflections on the first year of graduate employment. *International Journal of Employment Studies*, *22*(1), 39–59.

Sultan, P., & Yin Wong, H. (2012). Service quality in a higher education context: An integrated model. *Asia Pacific Journal of Marketing and Logistics*, *24*(5), 755–784. https://doi.org/10.1108/13555851211278196

Tabatabaei, M., & Gardiner, A. (2012). Recruiters' perceptions of information systems graduates with traditional and online education. *Journal of Information Systems Education*, *23*(2), 133–142.

Tan, K. C., & Kek, S. W. (2004). Service quality in higher education using an enhanced SERVQUAL approach. *Quality in Higher Education*, *10*(1), 17–24. https://doi.org/10.1080/1353832242000195032

van Dierendonck, D., & van der Gaast, E. (2013). Goal orientation, academic competences and early career success. *Career Development International*, *18*(7), 694–711. https://doi.org/10.1108/CDI-01-2013-0003

Wickramasinghe, V., & Perera, L. (2010). Graduates', university lecturers' and employers' perceptions towards employability skills. *Education + Training*, *52*(3), 226–244. https://doi.org/10.1108/00400911011037355

Wolniak, R., & Skotnicka-Zasadzien, B. (2012). The concept study of servqual method's gap. *Quality & Quantity*, *46*(4), 1239–1247. https://doi.org/10.1007/s11135-011-9434-0

Zafiropoulos, C., & Vrana, V. (2008). Service quality assessment in a Greek higher education institute. *Journal of Business Economics and Management*, *9*(1), 33–45. https://doi.org/10.3846/1611-1699.2008.9.33-45