

Employability profiles of Higher Education graduates: A person-oriented approach

Theoretical and empirical literature developed over recent years supports the concept of employability as a construct combining complex interactions of individual and contextual dimensions. This study aimed to identify differentiated profiles in graduates, combining personal and contextual variables related to employability. For this, 182 graduates from a public university were surveyed about their sociodemographic and educational pathways and employment status 18 months after university-to-work transition. Then, a latent class analysis was performed, which allowed the emergence of four distinct groups: *well-equipped*, *high demand*, *vulnerable* and *non-traditional pathways*. By adopting a person-centered approach, this study allowed the identification of different combinations of factors that, although recognized in current literature, seem to organize themselves differently among the heterogeneous population that presently obtain a higher education degree. This study also raises some practical implications, namely the importance of differentiated interventions, taking into consideration the specificities of each group.

Keywords: employability; higher education; graduates' profiles; university-to-work transition; person-oriented approach

Introduction

The topic of graduate employability has gained particular relevance, especially as access to Higher Education has become more widespread over the past few years (Bennett, 2019; OECD, 2018). In addition to that, new social and economic demands, largely resulting from globalization and rapid technological advances, have led Higher Education institutions to rethink the education and training offered, so that it can better adapt to the current needs of society and employers' organisations (Bennett, 2019; Clarke, 2018; Donald et al., 2018; Sin and Amaral, 2016). Entrance into the labour market might be challenging for new graduates, particularly for graduates from areas where there are fewer job offers, such as the Humanities and Social Sciences (Allen and van der Velden, 2007), and young adults will need to be able to identify and generate new opportunities (Bennett, 2019; Morgeson et al., 2005). The current complexity of the world of work suggests that newcomers to the labour market will need to activate and mobilize a complex set of attributes that may change over time and in different contexts (Savickas, 2012).

Theoretical and empirical literature developed over recent years supports the concept of employability as a construct combining complex interactions of individual and contextual factors (Dacre Pool and Sewell, 2007; Raffe, 2014; Tomlinson, 2017; Yorke and Knight, 2004). Given such complexity, different approaches to employability have been presented, namely the competence-based approach and the dispositional-based approach (Vanhercke et al., 2014). The first emphasizes the perceptions of abilities, skills and capacities as promoters of employability (Heijde and Van der Heijden, 2006). The second is based on the perceptions of proactive attitudes regarding career and work (Fugate and Kinicki, 2008).

Both of these approaches focus on a micro and subjective level, under the perspective that

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3 self-perceptions have an important role in determining their own employability (Vanhercke
4 et al., 2014). Taking a cross-sectional view of the various approaches found in
5 employability literature, several variables are hereinafter described.
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10 11 12 13 **Factors influencing employability**

14 15 16 *Gender and employability*

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19 Gender inequalities have been established as an issue in relation to several employment
20 outcomes, namely salary levels, career promotions, self-employment and reaching
21 executive positions (Álvarez et al., 2013; Bertrand et al., 2010; Gayle et al., 2012; Ginther
22 and Kahn, 2004), with disadvantageous results for women. Likewise, women apparently
23 derive less profit from extracurricular experience, work experience and training for career
24 development (Stevenson and Clegg, 2012; Tharenou et al., 1994). Concerning university-
25 to-work transition, previous studies have also demonstrated gender differences, with female
26 graduates presenting less positive perceptions of preparation and lower expectations of
27 successful transitions (e.g. Monteiro et al., 2016); men, on the other hand, show a greater
28 propensity to secure permanent and full-time employment and to reach better matches
29 between their educational level and employment (e.g. Vuorinen-Lampila, 2016).
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49 50 *Age and employability*

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52 Age is considered a controversial variable in the field of employability because it might be
53 difficult to disentangle from other variables, particularly at older ages (Froehlich et al.,
54 2015). Probably for this reason, previous empirical research addressing age's relationship
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3 with professional success is ambiguous. For example, Purcell and colleagues (2007)
4 suggest that mature students up to 30 years old present similar experiences to their younger
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6 peers. Blasko and colleagues (2002) report that students taking part in HE between 21 and
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8 24 years of age experience some advantages in the LM in comparison to younger
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10 colleagues, such as engaging in professional activity commensurate with their level of
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12 education and experiencing greater professional satisfaction. Nevertheless, several authors
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14 have identified greater difficulties from older workers adapting to career changes,
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16 especially when workers have maintained the same profession and job for a long time
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18 (Heckhausen et al., 2010; Van der Horst et al., 2017). Such ambiguity between studies may
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20 result, on one hand, from the accumulation of experience that typically follows the
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22 advancement of age, which increases individual heterogeneity (Staudinger and Bowen,
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24 2011). On the other hand, different results seem to derive from different age ranges
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26 (Woodfield, 2010). Moreover, core individual differences can play an important role in
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28 activating career adaptive resources and amortizing the impact of age on career transitions
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30 (Van der Horst et al., 2017).
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41 *Work experience and employability*

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44 Similarly, work experience seems to positively affect the development of other
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46 competencies (Allen and van der Velden, 2011), professional awareness (Beavis et al.,
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48 2005), and “job-getting skills”, such as CV and interview preparation (Hillage and Pollard,
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50 1998), although its impact apparently also depends on the type (being study-related or not),
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52 reflection on and duration and evaluation of such experiences (Allen and van der Velden,
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54 2009; Blasko et al., 2002; Dacre Pool and Sewell, 2007; Harvey, 2005).
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Parental education and employability

Parental education is one common representative variable of a social and cultural background, due to the strong impact it seems to exert on family income, future child occupation (Erola et al., 2016) and relevant cultural capital and soft skills for increasing the chances of securing a job (Malar Hirudayaraj, 2011). Blasko and colleagues (2002) identify direct effects across graduates from disadvantaged backgrounds when experiencing conditions of unequal access to the labour market, despite similar educational pathways, and indirect effects when such inequality arises from disadvantageous educational conditions. From this same perspective, Tomlinson (2017) argues that graduate capital is a crucial dimension for promoting access to human, social, cultural, identity and psychological resources, which in turn, will impact employment outcomes.

Competencies and employability

Graduates' competencies are among the domains that have been most strongly correlated with employability, namely with higher perceived employability and perception of preparation to work (García-Aracil et al., 2018; Qenani et al., 2014; Vanhercke et al., 2014; Wittekind et al., 2010). Some researchers have specifically addressed the question of correspondence between competencies developed through education and competencies required in the labour market. The overall results suggest that technical competencies are well-developed, but, in contrast, transversal competencies are below the current contextual requirements (McMurray and Dutton, 2016; Monteiro, Almeida, et al., 2019; Teijeiro et al., 2013).

Career management resources and employability

Research has also suggested that graduates' competencies impact on professional development can occur not only in a direct way, but also indirectly, being mediated by career management competencies (Monteiro et al., 2020; Rocha, 2012; Savickas, 2013; Taber and Blankemeyer, 2015). Career management resources, such as career adaptability, which refers to the set of resources that enable coping with predictable tasks and unpredictable adjustments (Savickas, 1997), have been proposed as crucial conditions for individuals to take best advantage of their attributes to adapt to contextual demands and to continuously develop new competencies (Bridgstock, 2009; Dacre Pool and Sewell, 2007; Savickas, 2013).

The present study

The diversity and complexity of factors that have shown a relationship with employment outcomes, especially in a context of high turbulence and job unpredictability, suggests there are several pathways that might open doors for employability. Most studies in this field have used variable-oriented approaches, which means that knowledge is developed through the relationships between variables. The concept of employability that underlies this study integrates the importance of the interconnection of the individual with his/her surrounding context and arises from the definition proposed by Fugate and colleagues (2004, p. 15): *a psychosocial construct that embodies individual characteristics that foster adaptive cognition, behaviour, and affect, and enhance the individual-work interface*. For this reason, a person-oriented approach in the field of employability is considered relevant,

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3 because it allows aggregating similarities in groups of samples that are characterized by a
4 high level of heterogeneity. This type of approach in the topic of employability is still rare
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7 (Rudolph et al., 2019). Some studies using latent profile analysis were identified with
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9 employees in later career stages, namely, focusing on job characteristics profiles
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11 (Mäkikangas et al., 2018), types of career orientation (Gerber et al., 2009), job insecurity
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13 profiles (De Cuyper et al., 2019) and job types and employee outcomes (De Spiegelare et
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15 al., 2017). The study of employment profiles, taking individual characteristics together with
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17 perceptions of competencies and career resources during university-to-work transition,
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19 represents a novelty in the field.
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24 Taking the above-mentioned factors into account, the main aim of this study is to gain a
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26 deeper understanding of employability for higher education graduates, considering its
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28 recognized complexity. To this end, we will search for different employability profiles,
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30 using the latent class technique. With this technique, groups will be characterized from the
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32 list of variables described in a literature review: gender, age, parental education, work
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34 experience, competencies, career management resources and employment situation.
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39 The research questions that will drive this study are: (i) are there different employability
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41 profiles among the participants of this study? If yes, (ii) how do these different groups are
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43 characterized? and (iii) which differences emerges between those groups?
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46 According to the literature, it can be expected that women and individuals with lower
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48 parental education may represent a group with more difficulties and, consequently, express
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50 lower levels of employability. In relation to age, although in isolation it may be a
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52 disadvantageous factor for employability, it might be expected to be a favorable factor in
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54 cases where it is associated with longer work experience. Lastly, it is expected that
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3 individuals with higher perceptions of competencies and career resources will demonstrate
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5 higher employability levels. Beyond these individual and education variables, some
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7 differentiation between groups according with their study field is also expected, namely,
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9 students coming from engineering fields with more favorable employment rates compared
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11 to students coming from the domain of the Social Sciences.
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18 **Method**

19 *Participants*

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21 A convenience sample of 182 graduates from a public university participated in this study,
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23 from four study fields: Economics (27%), Social Sciences (32%), Law (7%) and
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25 Engineering (34%). The average age of the participants was 25 years old and nearly 60% of
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27 the participants were female (n=108). Parents' education of the participants was
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29 heterogeneous among a maximum of 4 years of schooling (15%), maximum of 9 years of
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31 schooling (40%), secondary school (30%) and higher education (17%). About 60% of the
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33 participants reported having had some sort of work experience during their Higher
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35 Education studies.
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46 *Procedure*

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48 Data presented in this study are part of a broader longitudinal project that aimed to study
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50 graduates' employability, with several research aims: (i) to develop and validate
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52 instruments that can contribute to the understanding of graduate employability (Monteiro,
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54 García-Aracil, et al., 2019; Monteiro and Almeida, 2015); (ii) to characterize graduates
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3 with regard to their perceptions of competencies and preparation to work transition (García-
4 Aracil et al., 2018; Monteiro et al., 2016); (iii) to explore the relation between graduates
5 and employers' perceptions about competencies developed during higher education studies
6 (Monteiro, Almeida, et al., 2019); (iv) to explore the role of career adaptability in
7 graduates' employability (Monteiro et al., 2020; Monteiro, Taveira, et al., 2019). The study
8 design of this project consisted in an initial contact of the participants in the final year of
9 their Master's course, in a classroom context, where they provide general information
10 concerning sociodemographic and educational pathways, such as age, gender, study field,
11 work experiences and parents' education, and signed an informed consent form that
12 included a description of the aims of the study (wave 1). Then, about 18 months after work
13 transition, participants were contacted by email, to complete an online survey, where they
14 reported their employment status and completed the instruments described below (wave 2).

31 *Measures*

34 *Perceived competencies*

37 Participants were surveyed about their perceived scientific, practical and transversal
38 competencies. For this, a 5-point Likert item was formulated, ranging from 1 ("very weak")
39 to 5 ("very strong"): "Overall, how do you rate the quality of your university education
40 regarding your development in each of the following areas of knowledge/competency?" A
41 short definition of the competencies was presented to participants, as follows: scientific
42 competencies – theoretical content of the course; practical competencies – technical
43 training to perform a job; transversal competencies – the set of competencies transferable to
44 various professional activities, following the classification proposed by Garcia-Aracil and
45 van der Velden (2008): communication competencies - speaking and writing clearly and
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effectively; methodological competencies - ability to use tools and resources, such as problem analysis, information technologies, speaking a foreign language; interpersonal competencies - ability to work and interact with others, and to lead, manage conflicts, work in a team, motivate others, etc.; participative competencies - initiative, autonomy, self-motivation, decision-making, identification of opportunities, innovation, lifelong learning, etc.; organizational competencies - ability to organize tasks, to plan, to collect and process information, to be attentive to detail, etc.; socio-emotional competencies - ability to manage emotions and tolerate stress, self-confidence, self-control, etc.; generic competencies - general knowledge, sense of citizenship, ethical awareness, etc.; and employability competencies - job search strategies, adaptability and career decisions. The instrument revealed good validity evidence base on the internal structure. The original dimensionality (one-factor structure) was confirmed by a CFA using the WLSMV estimator ($\chi^2(35) = 93.390$; $p < 0.001$; $\chi^2/df = 2.668$; $n = 182$; $CFI = .975$; $NFI = .960$; $TLI = .967$; $SRMR = .076$; $RMSEA = 0.096$; $P(RMSEA) \leq 0.05$; $= .001$; 90% CI [.073; .120]) and reliability (internal consistency) for the single latent factor ($\alpha = .86$; $\omega = .80$). In addition, concerning university-to-work transition, participants were asked about their perceived preparation and expectations of success on a 5-point Likert scale, and about anticipated difficulties (dichotomous yes/no item).

Career adaptability

Career adaptability resources were measured through the Career-Adapt-Abilities Scale (Monteiro and Almeida, 2015), adapted from the original version developed by Savickas and Porfeli (2012) and from the Portuguese version published by Duarte and colleagues (2012). This scale is composed of four subscales: (i) concern – awareness of and planning

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3 for vocational future; (ii) control – self-discipline to shape the self and the environment in
4 order to cope with challenges; (iii) curiosity – propensity for the exploration of self and
5 contextual situations; (iv) – confidence – self-efficacy in relation to career aspirations and
6 career decisions (Porfeli and Savickas, 2012). Each of these subscales comprised 6 items,
7 formulated on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly
8 agree”). ”). The instrument revealed good validity evidence base on the internal structure. Such
9 validity was good both in terms of dimensionality, where the original second-order model was
10 confirmed through a CFA using the WLSMV estimator ($\chi^2(248) = 398.573; p < 0.001; \chi^2/df =$
11 $1.607; n = 180; CFI = .989; NFI = .973; TLI = .988; SRMR = .075; RMSEA = 0.058; P(RMSEA) \leq$
12 $0.05; = .101; 90\% CI [.047; .069]$) and reliability (internal consistency) with both second-order
13 ($\omega_{\text{partial } L1} = .96; \omega_{L1} = .88; \omega_{L2} = .91$) and first-order ($\alpha_{\text{Concern}} = .82; \omega_{\text{Concern}} = .82; \alpha_{\text{Control}} = .83;$
14 $\omega_{\text{Control}} = .83; \alpha_{\text{Curiosity}} = .87; \omega_{\text{Curiosity}} = .87; \alpha_{\text{Confidence}} = .89; \omega_{\text{Confidence}} = .89$) reliability estimates
15 showing good values. Since the first-order dimensions were used individually in the subsequent
16 analyses, the common method variance was tested using the Harman’s Single-Factor Test
17 (Podsakoff and Organ, 1986), which explained only 25% of the total variance.
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Data Analysis

The analyses were performed using the statistical software R (R Core Team, 2018). The
xlsx package (Dragulescu and Arendt, 2019), version 0.6.1, read and imported the excel
data file containing the dataset of the study in an R environment. The depmixS4 package
(Visser and Speekenbrink, 2019), version 1.4-0, performed the latent class analysis, which
is based in the assumption there is an underlying and unobserved categorical variable that
organizes a population into mutually exclusive groups (Collins and Lanza, 2010). Seven

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3 models were compared using the Bayesian Information Criterion (BIC). This criterion was
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5 used to choose the number of latent classes, where each model was composed by different number
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7 of classes (Dean and Raftery, 2010). Such models can then be compared using the BIC which is
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9 consistent under certain regularity conditions, it estimates consistently the number of mixture
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11 components, when all variables are relevant to the grouping (Keribin, 2000). Altogether, the BIC is
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13 a consistent model selection criteria also on a practical level (Fraley, 1998). The best model was
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15 the one that showed the lowest BIC value. Alternatives BIC for high-dimensional models were
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17 proposed as the one proposed by Gao and Song (2010) that should be used if researchers increase
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19 the use of variables with a certain increment of the sample size.
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23 Variables inserted in the models are listed in Table 1 with the corresponding descriptive
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25 statistics.
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31 *[Please insert Table 1 here]*
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37 The DescTools package (Signorell, 2019), version 0.99.28, calculated the confidence
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39 interval of the binomial and multinomial variables from the best model of the latent class
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41 analysis, while the confidence interval of numerical variables were performed through the
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43 following R function:
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47 confidence_interval <- function(vector, interval) {  
48   # Standard deviation of sample  
49   vec_sd <- sd(vector)  
50  
51   # Sample size  
52   n <- length(vector)  
53  
54   # Mean of sample  
55   vec_mean <- mean(vector)  
56  
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3   # Error according to t distribution
4   error <- qt((interval + 1)/2, df = n - 1) * vec_sd / sqrt(n)
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6   # Confidence interval as a vector
7   result <- c("lower" = vec_mean - error, "upper" = vec_mean + error)
8
9   return(result)
10  }
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13 Results

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16 Seven models, presented in Table 2, were performed. Model one assumed the presence of
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18 only one latent class, while model two assumed the presence of two latent classes, model
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20 three assumed three latent classes, and so on. The model with four latent classes was the
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22 best, showing the lowest Bayesian Information Criterion (BIC). This best model will be
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24 shown and discussed throughout this paper.
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37 Table 3 presents the obtained results, indicating percentages for categorical variables and
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39 mean values for ordinal variables. Ninety-five percent confidence intervals are presented to
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41 enable group comparisons.
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53 In Figure 1, it is possible to observe group differences graphically, when there is no overlap
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55 at the lower and upper limits of the confidence intervals.
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9 The group composing class 1 represents the smallest group with 27 participants (14.84%)
10 and an estimate of 89% of participants employed. This class is heterogeneous in terms of
11 graduates' fields of study. The average age (26.07), together with 74% of participants
12 having work experience, suggests this group might include non-traditional students that
13 typically access Higher Education when older than 17 to 19 years old. Class 1 presents
14 superior and significant differences from classes 2, 3 and 4, except for communication and
15 employability competencies, where the differences only emerged between classes 1 and 3.
16 Similarly, participants from class 1 are also characterized by more positive perceptions of
17 preparation than classes 2 and 3 and more positive expectations regarding university-to-
18 work transition than classes 2, 3 and 4. Regarding anticipation of difficulties, the scores are
19 significantly lower than class 3. Concerning career adaptability resources, class 1 also
20 stands out from the other classes for the subscales of concern, control and confidence and
21 from classes 1, 2 and 3 for the subscale of curiosity. Taking this set of characteristics, this
22 group was designated as *well-equipped*.
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41 The group derived from class 2 is the most numerically expressive, with 65 participants
42 (35.71%) and an 82% likelihood of being employed. This group has more engineering
43 graduates than graduates from the social sciences and law. The average age (22.67) and the
44 lowest percentage of having work experience (43%) indicate that traditional students
45 mostly compose this class. Concerning perceptions of competencies, preparation and
46 expectations for labor market transition, there are intermediate values, ranging from 3.5 to 4
47 points, similar to group 4. Group 2 presents lower career adaptability scores than class 1,
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3 for all the subscales, and significantly lower scores than class 3 for the subscales of concern
4 and confidence. Because of the study field of the participants that form this class (more
5 engineering graduates than from other courses), it might be a group that benefits from the
6 most advantageous market conditions. For this reason, it was called *high demand*.
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13 The group organized by class 3 represents 58 participants (31.87%) and is the least likely to
14 be employable, with an estimate of 62% of the participants being employed. This class has
15 significantly more female graduates than class 4, and significantly more graduates from the
16 social sciences, compared to class 2. Nearly half of the participants reported previous work
17 experience and, considering the class' average age (22.67), the data suggest the class is
18 composed of traditional students, especially when compared to classes 1 and 4. Class 3
19 presents significantly lower perceptions of the all competencies compared to class 1;
20 significantly lower perceptions of the all competencies, except for theoretical,
21 organizational and generic competencies, compared to class 2; significantly lower
22 perceptions from class 4 for practical, socio-emotional and employability competencies. It
23 is the group of graduates with the lowest perception of competencies, preparation and
24 expectations for working life, and with more difficulties anticipated. Also, this group is
25 characterized by lower scores regarding career adaptability resources. For all the subscales
26 of career adaptability, class 3 has lower scores than class 1; for the subscales of concern
27 and confidence, it has lower scores than class 2. Taking the several vulnerabilities
28 described, this class was designated as *vulnerable*.
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51 The group created from class 4, composed of 32 graduates (17.58%) has an estimate of
52 93% being employed, so this represents the highly employable group. A high number of
53 participants from Economics and male graduates form this class. These graduates present a
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3 higher average age (32.13) and are those with more work experiences reported. Less-
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5 educated parents predominate in this group, probably because of their older age, which is
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7 related to the low level of educational attainment of most of the adult population in
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9 Portugal, as in other countries. Regarding perceptions of competencies, intermediate scores
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11 are observable, compared to groups 1 and 3, with values ranging from 3 to 4 on the 5-point
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13 Likert scale. Despite work experiences registered, perceptions of preparation and
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15 expectations of success in the labor market are not very high compared to groups 1 and 2.
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17 In terms of anticipated difficulties in the university-to-work transition, it is similar to
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19 classes 1 and 2. Also, in regard to career adaptability resources, this group points to
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21 intermediate values, with lower scores for the subscales of concern, control and confidence.
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23 Taking these characteristics, this class is probably composed of graduates that were already
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25 in the labour market and went through Higher Education to upgrade their education. For
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27 this reason, it was designated as *non-traditional pathways*.
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38 Discussion

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40 This study aimed to deepen knowledge about the employability of higher education
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42 graduates, through the identification of differentiated profiles for graduates. The results
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44 obtained allowed the identification of four classes of graduates, combining individual and
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46 contextual characteristics, which suggests the existence of distinct employability profiles.
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48 Taking the measure of employment rates, significant differences were only identified
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50 between groups 3 and 4, confirming that gender – specifically, being a female - and the
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52 fields of the social sciences might represent vulnerable factors during university-to-work
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3 transition. Also, older ages, in association with previous work experience, relate to higher
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5 employment rates after such transition.
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8 The four classes identified through the conducted analysis brought out several other aspects
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10 that go beyond employment rates and gathered together variables that were identified in the
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12 literature. While two groups (*well-equipped* and *vulnerable*) seem to antagonistically
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14 aggregate several characteristics that are at the bases of current employability models,
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16 essentially focusing on individual resources (Dacre Pool and Sewell, 2007; Yorke and
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18 Knight, 2004), the other two classes (*high demand* and *non-traditional pathways*) bring out
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20 other aspects that have been less focused in the literature on graduate employability.
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23 Specifically, the *high demand* group, with a quite positive estimated employment rate, is
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25 not distinguished from the other groups in terms of stronger perceptions of competencies
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27 and career resources. Considering the professional activity of this group of graduates, with
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29 more engineers than social and law graduates, it is likely that positive employment
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31 outcomes are related to the current high demand for engineers in the labor market (Allen
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33 and van der Velden, 2007; Direção-Geral de Estatísticas de Educação e Ciência, 2018).
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36 Concerning the *vulnerable* group, if on one hand it looks like a group with a profile
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38 explained by competence-based employability models, in the negative sense (lower
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40 perceived competency is related to lower employment rates), on the other hand, this group
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42 also seems to aggregate graduates that face greater barriers in their transition to the labour
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44 market: being a female and having a degree in the social sciences (Allen and van der
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46 Velden, 2007; Álvarez et al., 2013; Monteiro et al., 2016). The group of *non-traditional*
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48 *pathways* comprises almost 18% of the sample of this study. If we consider political
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50 concerns to increase the population attaining tertiary education and the professional
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3 qualification of older people and for those already integrated into the labour market
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5 (Eurostat, 2019), this group deserves special attention. Despite this representing the group
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7 with the highest estimated employment rate, it is not the one that stands out the most in
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9 perceived competencies and career resources. If, on the one hand, it could be expected that
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11 professional experience would favour the development of competencies, career
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13 management resources and perceptions of self-efficacy, on the other hand, this group might
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15 experience other types of constraints that their peers typically do not experience. Examples
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17 of such constraints reported in the literature are a lack of self-confidence, financial
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19 difficulties, greater difficulty integrating into higher education, and difficulties related to
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21 the reconciliation of academic life with professional or family responsibilities (Humphrey,
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23 2006; Osborne et al., 2004). Thus, despite the work experience and likely maturity
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25 associated with older ages, these graduates might not benefit from adequate time for
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27 reflection and capitalization of work and life experiences, as has been suggested in the
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29 literature (Dacre Pool and Sewell, 2007; Turner, 2014; Yorke, 2004).
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36 While it seems reliable that individual resources and competencies are good indicators and
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38 predictors of employability, it is also important to consider what underpins the development
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40 of these resources, since our study showed that not all individuals develop such resources in
41
42 the same way. Current employability models have demonstrated to be very useful for the
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44 definition of empirical studies, important for the understanding of graduate's employability.
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46 Nonetheless, such models may be limited when it comes to understanding competency
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48 development pathways and the influence of contexts on these pathways. By adopting a
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50 person-centered approach, this study allowed the identification of different combinations of
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52 factors that, although recognized in current literature, seem to organize themselves
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3 differently among the heterogeneous population that presently obtain a higher education
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5 degree. Taking into account that the public accessing Higher Education is increasingly
6
7 heterogeneous (OECD, 2018), it becomes relevant to explore the specificities inherent to
8
9 each subgroup. This study raises important indicators of the need for differentiated
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11 interventions adapted to the specificities of each group. Indeed, different students' groups,
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13 within the same institution, might benefit from different interventions. Even given such
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15 specificities inherent to each group, there might exist a risk of generalist interventions not
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17 producing the desired effect.
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25 **Limitations and further research**

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28 This study represents a first attempt to identify employability profiles among higher
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30 education graduates. This implies the need for further studies that enable the confirmation
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32 of the identified profiles and to overcome some of the limitations this study presents.
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36 The use of the BIC as a criterion of model selection requires larger samples namely when
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38 the number of variables in the models is large. In the present study the sample size is not
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40 completely satisfactory, as so, future studies should collect larger samples. Also, it should
41
42 be acknowledged that participants in this study come from one single higher education
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44 institution, and from master level. Although this might be helpful for the recognition of the
45
46 diversity found in graduates' profiles, some caution should be taken in the extrapolation to
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48 other realities, where other types of profiles could emerge as a result of the heterogeneity of
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50 individual and contextual factors of other Higher Education systems. Furthermore,
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54 employability is a broad concept that goes far beyond employment rates or employment
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3 estimates. This means that if we would consider other employability outcomes, data found
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5 could be different. Therefore, the obtained results should be interpreted and contained
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7 within the measure of employability adopted in this study, which corresponded to the
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9 likelihood of employment 18 months after university-to-work transition.
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Table 1. Descriptive statistics of the variables inserted in the model

Variables	Mean	Standard Deviation	Min.	Max.	Skewness	Kurtosis	
Employment	1.21	0.41	1	2	1.38	-0.09	
Individual characteristics	Gender	1.41	0.49	1	2	0.38	-1.87
	Age	24.91	5.82	21	53	2.57	6.97
	Parental education	2.78	1.03	1	4	-0.48	-0.91
	Work experience	1.60	0.49	1	2	-0.39	-1.86
	Course	2.44	1.20	1	4	0.23	-1.51
Perceptions of competencies	Theoretical	3.98	0.66	2	5	-0.20	-0.10
	Practical	3.26	0.92	1	5	-0.32	-0.33
	Communication	3.75	0.70	2	5	0.10	-0.56
	Methodological	3.70	0.75	2	5	-0.22	-0.24
	Interpersonal	3.85	0.80	1	5	-0.49	0.55
	Participative	3.79	0.74	2	5	0.03	-0.61
	Organization	3.97	0.74	1	5	-0.51	0.66
	Socioemotional	3.64	0.89	1	5	-0.55	0.56
	Generic	3.79	0.77	1	5	-0.32	0.16
	Employability	3.25	0.91	1	5	-0.34	-0.08
Perceptions	Preparation transition	3.30	0.84	1	5	-0.21	-0.18
	Expectations transition	3.38	0.91	1	5	-0.51	0.37
	Difficulties anticipated	1.64	0.48	1	2	-0.59	-1.66
Career Adapt	Concern	3.97	0.53	2.17	5.00	-0.42	0.54
	Control	4.19	0.48	2.50	5.00	-0.27	0.03
	Curiosity	3.93	0.53	2.83	5.00	0.12	-0.62
	Confidence	4.22	0.46	2.83	5.00	-0.05	-0.41

Table 2. Models and its values from the Bayesian Information Criterion

Class	1 (n=27)	IC95%			2 (n=65)	IC95%			3 (n=58)	IC95%			4 (n=32)	IC95%		
Individual characteristics	Female	0.59	0.39	0.78	0.55	0.43	0.68	0.74	0.61	0.85	0.41	0.24	0.59			
	Age	26.07	23.71	28.51	22.67	22.18	23.09	22.67	22.24	23.14	32.13	29.31	35.50			
	PE: max 4 years	0.07	0.00	0.29	0.00	0.00	0.13	0.10	0.00	0.25	0.63	0.47	0.79			
	PE: max 9 years	0.52	0.37	0.73	0.45	0.32	0.57	0.34	0.22	0.49	0.31	0.16	0.47			
	PE: max secondary	0.15	0.00	0.36	0.37	0.25	0.50	0.38	0.26	0.52	0.00	0.00	0.16			
	PE: max HE	0.26	0.11	0.47	0.18	0.06	0.31	0.17	0.05	0.32	0.06	0.00	0.22			
	Work experiences	0.74	0.54	0.89	0.43	0.30	0.56	0.52	0.38	0.65	0.94	0.79	0.99			
Study Field	Economics	0.33	0.15	0.52	0.28	0.17	0.42	0.07	0.00	0.21	0.54	0.39	0.72			
	Engineering	0.30	0.11	0.48	0.48	0.36	0.61	0.36	0.24	0.50	0.09	0.00	0.27			
	Law	0.11	0.00	0.30	0.04	0.00	0.19	0.05	0.00	0.19	0.11	0.00	0.27			
	Social Sciences	0.26	0.07	0.45	0.20	0.09	0.34	0.52	0.40	0.66	0.26	0.10	0.43			
Perceptions of competencies	Theoretical	4.52	4.29	4.75	3.99	3.85	4.15	3.70	3.52	3.86	3.99	3.78	4.22			
	Practical	3.85	3.43	4.27	3.61	3.44	3.76	2.59	2.34	2.80	3.30	3.08	3.54			
	Communication	4.29	3.90	4.60	3.94	3.78	4.06	3.35	3.19	3.50	3.68	3.44	3.94			
	Methodological	4.51	4.29	4.75	3.85	3.71	3.98	3.21	3.02	3.40	3.59	3.37	3.82			
	Interpersonal	4.66	4.45	4.89	3.95	3.79	4.09	3.53	3.29	3.78	3.57	3.36	3.77			
	Participative	4.66	4.45	4.89	3.84	3.71	3.95	3.37	3.16	3.56	3.71	3.51	3.93			
	Organization	4.59	4.37	4.82	3.94	3.78	4.06	3.69	3.50	3.92	3.99	3.71	4.29			
	Socioemotional	4.66	4.48	4.86	3.67	3.52	3.80	3.10	2.84	3.33	3.73	3.46	4.04			
	Generic	4.82	4.66	4.97	3.72	3.58	3.87	3.46	3.27	3.66	3.64	3.37	3.88			
Employability	3.88	3.49	4.29	3.55	3.40	3.71	2.60	2.37	2.81	3.33	3.05	3.58				
Perceptions about work transition	Preparation transition	4.03	3.68	4.39	3.53	3.41	3.67	2.52	2.33	2.68	3.61	3.41	3.77			
	Expectations transition	4.14	3.84	4.45	3.70	3.56	3.82	2.68	2.44	2.90	3.37	3.06	3.69			
	Difficulties anticipated	0.48	0.29	0.68	0.58	0.46	0.71	0.86	0.74	0.94	0.50	0.31	0.69			
Career Adaptability	Concern	4.54	4.43	4.66	3.95	3.85	4.05	3.64	3.49	3.78	4.10	3.96	4.28			
	Control	4.62	4.49	4.74	4.18	4.09	4.29	4.00	3.86	4.11	4.20	4.01	4.38			
	Curiosity	4.39	4.20	4.59	3.88	3.77	3.98	3.73	3.60	3.86	3.98	3.78	4.20			
	Confidence	4.70	4.59	4.82	4.21	4.10	4.30	3.98	3.87	4.08	4.26	4.08	4.45			
Employment (yes)	0,89	0,71	0,98	0,82	0,70	0,90	0,62	0,48	0,74	0,93	0,79	0,99				

Table 3. Model of four latent classes: characterization of classes

models	BIC
1	9473.83
2	9098.83
3	9071.73
4	9047.51
5	9168.84
6	9300.33
7	9449.45

Figure 1. Graphical representation of means and confidence intervals of classes by variable under analysis

