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### **The Adaptable Graduate: Competencies for the Future of Work**

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## **The Adaptable Graduate: Competencies for the Future of Work**

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The transformations of the world of work, influenced by the Industry 4.0 era and recent developments in artificial intelligence, raise special concerns around the employability of the new graduates considering the impact of technology development in the redefinition of the jobs' characteristics and employees' profiles. These changes in the society of knowledge call into question the new graduates' readiness to join the labour market. Are they ready to face the challenges derived from the changes in the world of work? Do they have the necessary competencies to adapt to such transformations? What is the role of Higher Education institutions in the preparation of their students to meet the new market needs? Which challenges face these institutions to respond to the demands of both employers and employees? This chapter aims to open the debate around these issues and set the ground for the next chapters regarding the studies of the competencies for the future of work, the job opportunities for the new graduates and the mission of Higher Education institutions.

### **The competencies to thrive in a transforming world**

The innovations concerning artificial intelligence, tasks' automation and the growing digitalization of work and social life have been reshaping the labour market and, in particular, the graduate labour market. Technological, economical and societal factors have been highlighted as important drivers of change in the structure of employment and in the necessary profile of the graduates to adapt and succeed in the world of work.

The market needs and job demands are shifting at a fast pace, due to the advances in artificial intelligence and the technological changes, requiring the restructuring of the job tasks, a change in the social interaction patterns and in the overall work environment. The automation on employment has been causing some worry on the employees about their eventual replacement

in their occupation and their role in a society where smart devices are more and more able to perform an expanding number of tasks, most of them routine tasks but also other non-routine cognitive tasks (Lane & Saint-Martin, 2021). However, according to the same authors, the use of artificial intelligence and technological innovations may have a positive impact on job performance, enhancing employees' productivity, improving job quality and, eventually, demanding more human labour than before by creating the need of new tasks and new employees' profiles (Bakhshi et al., 2017). Other trends responsible for the job scenario restructuring, besides technological innovations, pertain to the growing concern with the environmental footprint and the globalization of the labour markets, which are also influencing the future demand for occupations and competencies (Bakhshi et al., 2017). To answer properly to the emerging challenges, workers need to engage in lifelong learning opportunities so they can adapt to the new occupations and tasks, which may be easier for workers in high-skilled occupations, since they have more opportunities to access to lifelong learning experiences and have the ability to learn new information (Lane & Saint-Martin, 2021).

Considering the constraints, but also the benefits that may come from all the transformations in the society and the world of work, new graduates need to prepare to the job market having in mind the current job opportunities, and, additionally, anticipating the future of work needs and the competencies to meet its demands in order to become robot-proof and stand out among their co-workers.

### **The adaptable graduate: Which competencies?**

The job market has been raising the need for the graduates to change or update their competencies. This latter term, however, is not consistently applied throughout the literature and is often used as a synonym of "competences" and "skills". A conceptual analysis seems to suggest that there is some agreement on considering "competence" as a broader term, referring to a more complex and holistic characteristic, and "competency" as a constituent or a resource of competence, that may be cognitive, conative, affective or motivational (Blömeke et al., 2015). For the purpose of this chapter, the term "competency" (and "competencies") will be used. It entails not only having the knowledge and skills to engage in professional activities, but also the ability to mobilize those knowledges and skills, as well as attitudes and values, to meet their particular demands (OECD, 2018) and lead to effective or superior performance (Boyatzis, 2008).

Three global sets of competencies have been identified as necessary for good performance in the labour market: (1) basic or core competencies (literacy, Science, Technology, Engineering

and Mathematics - STEM, and digital competencies), viewed as the foundation for learning and reinforcing other competencies' development and the basis for a person's drive to learn, adapt, and persist in a lifelong journey of learning and working in more specialized fields of knowledge (European Commission, 2018, 2019); (2) technical competencies, developed in the Higher Education context through formal and informal training opportunities that lead students to the acquisition of technical skills, knowledges and attitudes that are essential for the construction of a professional identity, and; (3) transversal competencies, which refer to the cognitive and noncognitive (National Research Council, 2012) competencies that foster job performance regardless the field of studies and, when developed at a considering level, gives leverage to someone when applying for a job opportunity (e.g. McClelland, 1973; Spencer & Spencer, 1993). Noncognitive competencies are also designated in literature as "socioemotional", "soft" skills, "life skills" or "21st century skills" (Puerta et al., 2016). "Cross-functional skills" (World Economic Forum, 2016) and "transferable competences" (Barbosa et al., 2017; National Research Council, 2012) are also commonly used as synonyms for transversal competencies. Throughout this chapter, the latter term – transversal competencies – will be used to address the cognitive and noncognitive competencies that are necessary and common to the different fields of study and work (e.g. critical thinking, teamwork).

Nowadays, basic and technical competencies remain fundamental for learning and development of work-related competencies. Some of them are becoming even more relevant in specific occupations and tasks related to artificial intelligence, data literacy, coding, programming or statistical control, considering the fast paced technological changes and the growing valorisation of the digital competencies in personal and professional contexts, and taking into account the higher returns from STEM competencies in graduate labour markets both in the initial transition to work and across the life-cycle (Lane & Saint-Martin, 2021; Webber, 2014). However, transversal competencies such as teamwork, communication, adaptability, are extremely important for lifelong learning and the adaptation to the future of work fostered by the continuing changes in technologies, markets, organizations and in society, which explains the focus of this discussion in transversal competencies. These competencies are known to predict job performance and success in the labour market (Borghans et al., 2015; Deming & Kahn, 2018; Heckman & Kautz, 2012; McClelland, 1973; Spencer & Spencer, 1993). Different approaches have been used to identify the most relevant transversal competencies in education and training fields and in working contexts, some of which are theory-driven, with the development of frameworks that summarize the competencies that

might be relevant for the future of work (e.g. Binkley et al., 2012) and other based on job analyses, searching for the necessary competencies to perform a specific job in databases such as the Occupational Information Network (O\*NET) (e.g. Burrus et al., 2013; Vista, 2020). Other options lay on consulting the employers about the competencies they look for when hiring new employees for their companies (e.g. Succi & Canovi, 2020) or performing a content analysis of (online) job advertisements to identify the competencies explicitly requested by the employers from applicants across a wide variety of jobs (e.g. Bennett, 2002; CEDEFOP, 2019; Rios et al., 2020). Regardless the adopted approach, there is a consensus concerning some of the most valued and demanded transversal competencies in higher education graduates, namely teamwork, effective communication, problem solving or time and information management (e.g. Rios et al., 2020; van Laar et al., 2020). These transversal competencies are, frequently, suggested to be grouped in three main categories (see Table 1): cognitive, intrapersonal and interpersonal (Bacigalupo et al., 2016; National Research Council, 2012).

Table 1: Categories and Examples of Transversal Competencies

<b>Cognitive Competencies</b>	<b>Intrapersonal Competencies</b>	<b>Interpersonal Competencies</b>
Creativity	Adaptability	Effective communication
Complex problem solving	Lifelong learning	Teamwork
Decision making	Open mindset	Conflict resolution
Critical thinking	Cultural awareness	Leadership
Innovation	Initiative	Collaboration
	Autonomy	Empathy
	Resilience	Persuasion
	Self-regulation	
	Goals definition	
	Time and information management	

The first category, regarding cognitive competencies, refers to general mental abilities to understand complex ideas and to think and act to overcome obstacles, solve problems, comprehend complex ideas, adapt to the circumstances and learn from experience (European Commission, 2018; UNESCO, 2016). Competencies such as creativity, complex problem

solving, decision making and critical thinking have become highly valued to face the challenges of the future of work, considering that, on the one hand, they can hardly be found in machines and technologies, and, on the other hand, they are extremely useful for the graduates to deal with the great amount of information available in this era of digitalization of work and social life, to adapt to new tasks or occupations, and respond to the job demands in a customized and, potentially, innovative way, providing positive consequences and added value to an organization (Frigotto, 2018).

A second category of transversal competencies relates to the intrapersonal competencies of the individual to self-regulate one's own behaviour and emotions, to trust on personal ability to generate value for others (Bacigalupo et al., 2016), and pursue learning opportunities to achieve personal and professional goals (National Research Council, 2012; OECD, 2018). Adaptability, i.e., the ability to cope with changing work conditions and to alter behaviours, adjust plans and methods, change opinions or redefine goals, stands out as an indispensable competency to deal with new information and meet the demands of the environment (Pulakos et al., 2000; Savickas & Savickas, 2016; World Economic Forum, 2015), and, therefore, to face the new challenges imposed by the transformations in the labour market. This implies the use of other competencies that foster the potential of the individual to be adaptable, such as being open minded and cultural aware (OECD, 2018); being able to define goals to achieve personal success, which influences the effectiveness of the organizational performance (European Commission, 2019; Tett et al., 2000); to monitor personal and/or other individuals' performance, allot cognitive resources and manage time to make improvements (World Economic Forum, 2016). Additionally, assuming a positive attitude at work, demonstrating initiative to take on tasks, autonomy when looking for solutions for the challenges that may arise in the workplace and resilience to positively adapt to and grow with adverse experiences (Bakker & Schaufeli, 2008; Caza & Milton, 2011; Frese & Fay, 2001; World Economic Forum, 2016) makes individuals more prone to manage future challenges.

A third category relates to interpersonal competencies, involving the abilities to express ideas, receive and respond to messages from others and interact with them in a positive manner (National Research Council, 2012). To adapt and thrive in the labour market, individuals can hardly work in isolation. As part of an organization, the individuals must be able to work in a team, to engage with their colleagues to reach a common goal and to solve any conflicts that may arise (Bedwell et al., 2012; Brubaker et al., 2014; Ellis et al., 2005). Communicating effectively, being empathetic with the team members, and having the ability to lead others, influencing and persuading them, are competencies that make a difference in the work context

(European Commission, 2019; Hoy & Smith, 2007; Quintanilla & Wahl, 2017), and are, therefore, highly demanded by employers (e.g. Burrus et al., 2013).

In addition to the cognitive and intra- and interpersonal competencies, literature from the Economics field has raised the attention for the demand, in the job market, of competencies linked to a wider understanding of the outer contextual environment, due to its importance in shaping one's performance. Considering a transitional approach, changes in the context demand some accommodations from people facing the need to adjust their actions to accomplish their goals (Dunn et al., 1994). Having market orientation, i.e., understanding the customers, the organization and the wider business environment, adds business value to the graduate profile (Sen, 2006) and, in the last stance, creates added value for the customers and the employer (Narver & Slater, 1990). The graduates should also be able to make themselves known in the marketplace with the purpose of becoming more attractive in the job market (Sheperd, 2005). To actively develop, commodify and communicate one's own competencies within a profile relevant to others in a work context, is also a sign of adaptability and a way to prove one's worth and stand out in the realm of the job market.

Considering the wide range of competencies that foster the potential of a graduate to be employable, adaptability seems to sum up a big part of what is expected from a graduate after Higher Education studies. Being adaptable, willing to learn new tasks or an occupation, changing or reinventing working methods or techniques to provide customized services or products, being open to different points of view and cultures to solve complex problems, are, indeed, some of the competencies that give leverage to the graduates and, ultimately, to the company or organization where they belong. At the same time, these transversal competencies are not easily automated and replicated by artificial intelligence mechanisms, so it seems that artificial intelligence related competencies might assume a complementary role to the human labour, limiting its potential to replace human workforce in a set of tasks and occupations (Lane & Saint-Martin, 2021). Learning and developing these transversal competencies to a higher level is not only possible, since they are considered changeable and permeable to life experiences, education and explicit interventions (Boyatzis, 2008; Epstein & Hundert, 2002; National Research Council, 2012; Shavelson, 2010), but also desirable, as its improvement can last for years (Boyatzis, 2008). Therefore, a growing number of graduation schools have been making efforts to provide training opportunities in this subject (e.g. Barbosa et al., 2017) to make their students more adaptable and foster their readiness to enter the job market.



## **Are graduates adaptable? Employers' and graduates' perspectives**

### *Employers' perspectives*

The employability of graduates has been widely explored in literature, according to individual, educational and organizational perspectives (Harvey, 2001). Pointing to profound changes in the labour market (Fugate et al., 2004; Sung et al. 2008), these have imposed on young graduates a greater capacity to adapt to continuous changes, even leading them to accept lower positions, with less pay or outside their training area (Clarke, 2017). The preparation of graduates for the current demands/challenges of the labour market has been a concern of literature (e.g. Barbosa & Freire, 2019; Succi & Canovi, 2020). According to Clarke (2017), this preparation of graduates implies not only the acquisition of technical/hard competencies but also that of transversal/soft competencies, including career management competencies (Bridgstock, 2009), which are fundamental to assist graduates to navigate in an uncertain and dynamic world of work. Although the trend in recent decades has been to value technical competencies for a successful entry into the labour market (Balcar, 2016), the truth is that there currently seems to be a consensus regarding the importance of also recognizing the acquisition of transversal competencies (Haselberger et al., 2012; Seligman 2002), especially by employers (Barbosa & Freire, 2019). While employers seem to be generally satisfied regarding graduates' technical competencies, some concerns have emerged about graduates' lack of transversal competencies (Hurrell, 2016; Monteiro et al., 2019): their poor preparation for the demands imposed by everyday work situations (Andrews & Higson 2008) and, more specifically, their incapacity to transfer knowledge when solving real-life situations (Shuayto, 2013). Great criticism has been addressed concerning the role universities should play in the development of transversal competencies (Hurrell, 2016). Despite the study by Low and colleagues (2016), which claims that employers primarily look to graduates as a source of technical competencies, according to Archer and Davison (2008), employers attach even greater importance to soft competencies when compared to students' higher education qualifications. However, these studies have found that transversal competencies have been the target of greater attention on the part of organizations (Stewart et al., 2016) and universities (Pang & Hung, 2012). This means that, although technical competencies can represent a basic labour market access platform, transversal competencies are inevitably a differentiating element between qualified job applicants (Monteiro & Almeida, 2021; Tomlinson, 2008).

In this sense, in the employers' perspective, universities must play an important role in the development of these competencies (Succi, 2019), more specifically in the transfer of this knowledge to organizations by solving concrete problems (Succi & Canovi, 2020). Greater collaboration and partnerships between employers and universities have been considered by many scholars as essential when aligning training with current job requirements (Archer & Davison 2008; Clarke 2017; Sin & Neave, 2016). This collaboration can be undertaken in different manners: the participation of employers in the development of *curricula* or in the revision of programs *for the* development of transversal competencies; holding sessions/workshops on *campus*; the creation of more internship vacancies in different areas; and the development of case-studies that can be applied to different subjects (Archer & Davison, 2008). Curriculum internships (e.g. Andrews & Higson, 2008; McQuaid & Lindsay, 2005) or other mechanisms, such as field days and seminars with CEOs and managers (e.g. Barbosa & Freire, 2019), are considered to be effective mechanisms in promoting the development of transversal competencies. Formal teaching activities are carried out in the context of regular classes (e.g. Andrews & Higson, 2008), and are aimed at developing competencies such as teamwork, presentation, as well as analysis and synthesis competencies (e.g. Barbosa & Freire, 2019). In addition to these, extracurricular activities – namely volunteering work and team sports, or participation in international mobility programs – are also considered to be important in the graduates' training.

There seems to be a consensus in literature regarding the need for collaboration between companies and universities in the reflection, planning and implementation of mechanisms that promote the development of transversal competencies in graduates. Thus, the question that arises is: which transversal competencies are the most important for companies today from the employers' perspective?

Literature seems to indicate employers' preference for certain transversal competencies (Barbosa & Freire, 2019; Succi & Canovi, 2020), as well as a set of competencies that employers associate to graduates' "work-readiness" (e.g. Andrews & Higson, 2008; Azevedo et al., 2012; Jurše & Tominc, 2008). A study carried out in nine European countries (de Weert, 2007) indicated that the competencies most valued by employers when hiring graduates were: teamwork, problem-solving, planning and coordination, communication competencies, and responsibility. Another study conducted among employers from Austria, the United Kingdom, Slovenia and Romania highlighted other competencies such as: persuasion, teamwork and relationship building, self and time management, leadership, presentation and communication competencies, as well as critical, analytical and holistic thinking (Azevedo et al., 2012). The

results of a study carried out with Portuguese employers indicated that recent Management graduates are expected to combine solid technical knowledge, gained at a reputable university, with transversal competencies (Barbosa & Freire, 2019). A recent study, by Succi and Canovi (2020), pointed to teamwork, communication, result orientation, and learning competencies as the most valued by employers. The set of competencies highlighted by employers include cognitive, intrapersonal and interpersonal (National Research Council, 2012). Cognitive competencies include, for example, analysis and synthesis competencies, creative and critical thinking, decision making, learning competencies, organization, presentation and problem solving. As intrapersonal competencies, the following were highlighted: adaptability/flexibility, autonomy, conscientiousness and responsibility, discipline and focus, emotion management, initiative/proactivity, feedback acceptance, self-motivation, resilience, tolerance to change and uncertainty, amongst others. Regarding interpersonal competencies, the following competencies were emphasized by employers: empathy, conflict management, leadership, teamwork, persuasion/influence and non-verbal communication.

Despite the vast catalogue of competencies identified, the following were underlined as employer preferences: teamwork, conflict resolution, and the ability to motivate oneself and others. Adaptability/flexibility, tolerance to change and uncertainty, as well as decision making, were also listed as competencies which are increasingly required in contexts of great change. Indeed, some studies have indicated that new graduates must develop competencies which are essential to global markets as well as in the relationship with external stakeholders (Beenen & Pichler, 2016; Boyatzis, 2008). Verbal and non-verbal communication, persuasion/influence and empathy were also considered to be important competencies when addressing the ever-changing demands of the current labour market. However, employers' preferences for certain competencies may be associated with results for companies and profits (Deaconu et al., 2014; Ryan et al., 2012). The competencies which influence business profitability are, according to Ryan and colleagues (2012), 'team leadership', 'achievement orientation', 'developing others' and 'impact and influence on others', whereas to Deaconu and colleagues (2014), they reside in the ability of 'assuming responsibility', 'efficient activity planning and organization' and 'promptness and efficient time management'. A more recent study, by Pang and colleagues (2019) showed that employers highlighted five competencies, which are categorized as soft competencies by Rainsbury et al. (2002). This top-five was composed of: 1. 'ability and willingness to learn', 2. 'teamwork and cooperation', 3. 'hardworking and willingness to take on extra work', 5. 'self-control' and 'analytical thinking'.

Although different studies found in literature indicate different transversal competencies, the general trend seems to be towards competencies related to interacting with others, such as teamwork and cooperation, empathy, communication (preferably in different languages). Nevertheless, there is also an emergence of competencies associated with a new way of working and the new demands of the labour market, namely, adaptability, flexibility, learning, resilience, self-control, as well as an orientation towards results and persuasiveness.

### ***Graduates' perspectives***

The increasing expectations of employers on young applicants' job readiness (Azevedo et al., 2012; MacDermott & Ortiz, 2017) have stimulated research also focused on graduates' perceptions regarding transversal competencies, namely their importance and acquisition during academic studies. Graduates from several national contexts and branches of knowledge have been disclosing their understanding of the critical role of transversal competencies to enter and succeed in labour markets that are ever more complex and unpredictable (e.g., Fenech et al., 2020; MacDermott & Ortiz, 2017; Succi & Canovi, 2020). For example, Walker and colleagues' (2015) investigation involving 450 graduate nurses from Australia revealed that these young professionals interpret work readiness as extending beyond technical ability; instead, they associate the concept to a broader collection of competencies, including teamwork, communication, adaptability, and conflict management.

The results of a study undertaken by Rainsbury and colleagues (2002) in New Zealand suggest, though, that graduates require some professional experience to comprehend the actual value of transversal competencies. Other investigations have pointed to similar results, such as Nilsson's (2010) qualitative research focused on the perceptions of twenty recent graduates in IT engineering in Sweden. Initial interviews were conducted when those engineers worked between one and nine months in an area relevant to their education, and follow-up interviews took place when they had worked between three and four years. According to the initial results, the then new graduates elected the technical competencies as the ones that were fundamental to enter the IT labour market. However, they later appreciated that transversal competencies are paramount to remain employed and succeed. Likewise, in a qualitative study conducted in Portugal with graduates attending master's degrees in the fields of Economics and Business, several participants recognized that they needed some professional experience to understand that competent job performance requires a combination of technical knowledge and relevant transversal competencies (Barbosa, Freire & Santos, 2017). This lack of preparation is also

observable through the low levels of career agency during graduation.

According to recent research, self-exploration and exploration of the labour market are frequently initiated when the new graduates are confronted with the need to get a job, i.e., when transitioning from university to work (Monteiro et al., 2020). Amongst the cognitive transversal competencies that graduates deem to enhance employability, they seem to especially recognize the importance of decision making, critical thinking, creativity and innovation, learning competencies, and problem solving (Gammie et al., 2002; MacDermott & Ortiz, 2017; Nilsson, 2010; Rosenberg et al., 2012; Succi & Canovi, 2020; Wickramasinghe & Perera, 2010). Intrapersonal competencies highlighted by graduates were found to include conscientiousness and responsibility (Succi & Canovi, 2020), ethics (Rosenberg et al., 2012), time management (MacDermott & Ortiz, 2017), as well as adaptability/flexibility, self-motivation, and self-esteem (Barbosa et al., 2017; Nilsson, 2010; Wickramasinghe & Perera, 2010). In the catalogue of interpersonal competencies, graduates tend to ascribe great value to teamwork, leadership, conflict management, negotiation and persuasion, and oral and written communication in the native and foreign languages (Andrews & Higson, 2008; MacDermott & Ortiz, 2017; Raybould & Sheedy, 2005; Rosenberg et al., 2012; Succi & Canovi, 2020; Wickramasinghe & Perera, 2010).

The previously mentioned results have led some authors to conclude that graduates' perceptions are becoming more aligned with the employers' views (Pereira & Costa, 2017; Rosenberg et al., 2012; Succi & Canovi, 2020; Wickramasinghe & Perera, 2010). Moreover, the literature relates the convergent opinions found amongst graduates from distinct countries with the demands of the global economy and the increasing homogeneity in higher education curricula (Keeling, 2006; Prokou, 2008). Nevertheless, some investigations point to singular results. Wickramasinghe and Perera's (2010) study with computer science graduates in Sri Lanka revealed that female graduates gave higher importance than their male colleagues to all listed transversal competencies except oral communication. This might be a result of graduates' perceptions about the increased barriers still faced by women in accessing the labour market. Indeed, the perception of preparedness and expectations of success in the transition to the labour market depends on gender (Pereira & Costa, 2017), with the first working experiences having, seemingly, a negative impact on women's self-beliefs about their ability in this process (Monteiro et al., 2016). In regard to leadership, the survey conducted by Succi and Canovi (2020) with 169 masters' business students and recent graduates, mainly from Italy and Germany, revealed they ranked this competency of lowest importance, which, as hypothesized by the authors, may be due to the belief that leadership is not essential at the beginning of one's

career. Additionally, participants in this last study credited less relevance to ethics, creativity, and innovation compared to employers. Asymmetries between these two populations were previously detected in the Portuguese context, with graduates ascribing less value than employers to foreign languages, teamwork, and conflict management (Cabral-Cardoso et al., 2006).

Research has also been focused on recent graduates' sense of preparedness to enter the labour market, bearing in mind their proficiency in transversal competencies. In 2012, Twenge, Campbell and Gentile concluded that by comparison to previous generations, US college students are more likely to overestimate their transversal competencies, specifically regarding motivation, leadership, self-confidence, and written and oral communication. In the same country, the survey designed by Stewart, Wall and Marciniak (2016) revealed that most of the 214 participant college students were confident in their competencies of written communication, critical thinking, and problem solving. However, the authors highlighted that whilst those transversal competencies are sought after by the labour market, graduates' abilities in such areas are still falling short of employers' expectations, which points to a mismatch between the confidence levels of new graduates and the views of those who hire them. The study conducted by García-Aracil and colleagues (2018) also evidenced that, before work transition, students tend to overestimate their transversal competencies compared with employers' perspective, while the opposite seems to happen regarding technical competencies. Nonetheless, other studies found that recent graduates acknowledge they do not possess the ideal levels of transversal competencies development (e.g., Teng et al., 2018). In a research with 302 Emirati graduates from five specializations (Business, Information Technology, Health Sciences, Applied Communication and Engineering), participants scored the highest confidence in technical competencies and the lowest in intrapersonal competencies (Fenech et al., 2020). Wickramasinghe and Perera's (2010) study in Sri Lanka revealed that the participant graduates in computer science rated the possession of a particular transversal competency less than the level they deemed ideal when applying for the first job, except for basic arithmetic. Furthermore, several investigations indicate that whilst graduates consider to have acquired certain transversal competencies during higher education, they recognize limited development in others. Andrews and Higson's (2008) exploratory study with a sample of business graduates from the UK, Austria, Slovenia, and Romania revealed they felt especially qualified regarding teamwork competencies, but less prepared on public speaking. Data drawn from a questionnaire survey focused on the UK context (Wilton, 2011) exposed that Business and Management graduates positively evaluated their acquisition of written and oral

communication, teamwork and basic computer literacy, but declared weak development of advanced IT, creativity and entrepreneurial competencies throughout their studies. In Portugal, students from several master's degrees argued to have significantly developed a set of transversal competencies (namely, problem-solving, adaptability, and motivation/personal drive), but admitted possessing less robust interpersonal competencies (Barbosa et al., 2017). Although relevant, the conclusions drawn from these investigations merit some questioning since they are based on individuals' self-assessment, while more objective measures of competencies' assessment are usually absent.

The growing awareness of recent graduates on the importance of transversal competencies and, simultaneously, on their insufficient job-readiness, has led them to conclude on the need for distinct agents to become more committed to the long-term development of students and graduates. In particular, they understand that Higher Education institutions should more effectively sensitize students about the value of transversal competencies and prepare them accordingly, namely by fostering curricular environments that support the acquisition of transversal competencies and promoting regular interaction opportunities between graduates and employers (MacDermott & Ortiz, 2017; Nilsson, 2010; Succi & Canovi, 2020; Teng et al., 2018). In this respect, both the graduates who benefited from a curricular internship and those who did not tend to evaluate such experience as notably contributing to the development of transversal competencies (Andrews & Higson, 2008; Barbosa et al., 2017; Crebert et al., 2004). Additionally, graduates recognize that students and young graduates need to become more involved and motivated in the development of their transversal competencies (Nilsson, 2010; Succi & Canova, 2020). In a study conducted in the UK by Whittle and Eaton (2011), medicine students appreciated that the module of transversal competencies in the first year of the degree contributed to their acquisition of several transversal competencies, but principally to enhance their self-confidence, responsibility and independence during the overall educational process. Portuguese graduates participating in a focus group methodology (Barbosa et al., 2017) came out to the conclusion that transversal competencies development is a continuous process which significantly benefits from a variety of experiences initiated by students during higher education, including social interaction, sports activities, volunteer work, and extra-academic activities (e.g., participation in students' associations). This leads to a necessary sense of agency from the new graduates that should begin during higher education studies. This is essential from an individual perspective, where new professionals should be able to continuously reflect on their professional development and to fit to new labour market demands, but also from an organizational perspective, where organizations should be able to

rapidly adapt to contextual and unexpected changes. This was particularly observable recently, when several of the surviving organisations of the covid-19 crisis were those that were able to quickly adapted their work models and innovated to respond to constraints that resulted from containment measures implemented in most countries (Molina-Sánchez et al., 2022; Salanova, 2020). Finally, graduates tend to contemplate that employers should allocate more resources to the development of new hires' transversal competencies (especially those with significant impact on the individual performance and the organizational success), as well as collaborate on Higher Education institutions' initiatives that foster the contact between students and companies (Crebert et al., 2004; Nilsson, 2010; Succi & Canovi, 2020).

### **Higher Education institutions: Challenges in the graduates' preparation for the future of work**

Higher Education institutions are being challenged to engage in a broader educational approach where teaching scientific and technical competencies remains the main objective of a graduation course, but is no longer in exclusivity. Both employers and future employees (and their families) expect that the educational path graduates took will prepare them for the future of work and question the value of the educational path, its relevance and profitability considering the time and money costs involved (Wolff & Booth, 2017). This is particularly noticeable from students' motivations for accessing higher education, who are mostly driven by the expectation to foster their employability (Dias, 2013). Until recently, the mission of Higher Education institutions was focused on scientific and academic knowledge acquisition; however, nowadays, it is currently expected from universities a different and increasingly more important role, that is to provide their graduates with employability transversal competencies that enable them to succeed in a continuously changing job market driven by technological change (Bakhshi et al., 2017). In a global knowledge society, Higher Education institutions are under pressure to prepare graduates capable of entering the job market and provide added value to the company or organization not only through technical job-related competencies, but also (or specially) through their abilities to work in teams, critically think about potential problems and finding innovative solutions and communicate them. Regardless of the field and level of education, and the working context, dealing with uncertainty is also valued since the job market is continuously challenged with new necessities to respond to, both from the employer and the employee. This demands from the graduates competencies such as adaptability, learning to



learn and resilience, which are, in fact, fundamental for the graduate to prosper in other life contexts, namely personal, family and social ones (Monteiro & Almeida, 2021).

Considering this overview, higher education stakeholders are facing the need to adapt their curricula design and change teaching and assessment practices to promote graduates' employability, which raises several questions. The assessment of transversal competencies is a challenging task considering the complexity and multidimensionality of the definition of each competency and its assessment procedures (Zlatkin-Troitschanskaia et al., 2016). Transversal competencies may comprise both cognitive and noncognitive components and, in addition, commonly one competency requires the mobilization of a broader range of competencies that are interconnected (e.g. Hughes & Jones, 2011). The identification of the competencies to be acquired are usually translated in the expected learning outcomes of higher education programs, i.e., the expected knowledge, abilities, attitudes and competencies students should master at the end of the cycle of studies, including domain-specific technical competencies and generic competencies (CEDEFOP, 2011). However, the assessment of the competencies, generic or transversal ones, is not straightforward since assessment procedures and educational teaching practices are more directed towards the technical competencies. Some constraints are found in the assessment of transversal competencies in higher education students, as the answers, for instance, to when and how to assess them raise some concerns. Assessment can be performed at the beginning, over the course and/or at the end of the studies to provide information, respectively, on the students' prerequisites, competencies' acquisition and/or learning outcomes (Zlatkin-Troitschanskaia et al., 2016). The timing for the assessment, thus, depends on the question to be answered and the purposes of the assessment. Several countries, such as Brazil, United States and Australia, have been taking on initiatives to develop higher education assessments with standardized instruments embracing domain-specific and generic competencies, considering their valorisation by prospective employers. Some of the countries, such as Colombia and Australia, measure generic competencies both at the beginning and at the end of the studies (Zlatkin-Troitschanskaia et al., 2016). Educational assessment practices have been debated concerning not only which competencies to assess and when, but also the methodological approach to address assessment needs. To enhance competencies' assessment, a reliable method or instrument should be used to adequately measure students' competency levels, i.e., to tap students' competencies reliably and fairly, thus facilitating decision-making on the best practices to improve higher education learning outcomes and curricula (Wilson & Scalise, 2006).

With regard to teaching and training practices, a transformation is needed to include the provision of learning opportunities for graduates to apply their knowledge inside and outside the classroom, organize projects, make decisions and solve complex problems, which are more profitable for graduates and different stakeholders (e.g. academics, business managers, governments), if developed in working contexts (internships), volunteering experiences, learning communities or groups of students, in collaboration between universities and industries (e.g. Jackson, 2015; Pitan, 2016). Students are incentivized to actively participate in problem analysis and contribute with potential solutions, to work with others, to apply their prior learning; in return, new knowledge and competencies are developed and lifelong learning is recognized as indispensable to adapt to societal, professional and personal challenges. While this is beneficial for students, not only as a way to foster technical and transversal competencies, but also as a way to promote students' metacognitive competencies, that results from the confrontation with difficulties related to knowledge transfer. Indeed, opportunities for inexperienced workers to reflect on their own practices, competencies and efficacy beliefs have been proved to be relevant predictors of employability (Bridgstock, 2009; Lent et al., 2000; Smith et al., 2019).

Anticipating the needs of the future of work, it seems relevant for Higher Education institutions to implement pedagogical practices that incorporate the participation of the graduate students in organisations within the community in accordance with the field of studies and the professional area of interest so they can build up a set of competencies grounded in the marketplace needs (Monteiro & Almeida, 2021). Learning and working with international colleagues should also be fostered to promote a wider understanding of the cultural differences and facilitate the development of a more adaptable and open mindset. These seem to be experiences that enhance the competencies of the future graduates.

Even though it is not a goal that should be assumed only by Higher Education institutions, promoting transversal competencies throughout the academic experience, integrated in the courses' curricula, should be part of the scope of competencies to be developed. As it is not possible to identify one single predictor of employability, there is no "one-size-fits-all" model for Higher Education institutions. Because employability is a multidimensional and dynamic concept, dependent on the historical, social and cultural environment, different strategies will depend on the capacity to adapt to the characteristics and necessities of each context (Monteiro & Almeida, 2021). Moreover, the current diversity of students that access Higher Education institutions should not be ignored, as different profiles may require singular forms of intervention.

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