

Skills and the employability of university graduates

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06

CONCLUSIONS

6.1 Summary

This thesis examined the relationship between skills and the employability of university graduates. In particular, this thesis attempted to answer the following questions:

- What are the trends that shape the labour market of graduates and how do they affect employers' skill demand?
- Which skills are most important in the graduate recruitment process?
- How is students' personality related to their field of study choice?
- Which skills protect graduates against a slack labour market?

In this chapter, I summarize the answers to these four questions given in the respective chapters, and I will draw broader conclusions about the implications of the findings for individuals and universities.

6.1.1 What are the trends that shape the labour market of graduates and how do they affect employers' skill demand?

The thesis set out with a discussion of the labour market of today's graduates (Chapter 2). We brought forward the idea that various societal, economic and organizational trends are changing the work environment of graduates. A key concern which we tried to convey in this chapter is the changing demand for skills developed in higher education in terms of both character and level.

We identified six trends which are at the core of the changing role of graduates in economic life. These trends are *the knowledge society, increasing uncertainty, the ICT revolution, high performance workplaces, globalization, and the change of the economic structure*. By changing the nature and range of tasks graduates are expected to fulfil in today's economy, these trends generate new and intensify existing skill demands, which we summarized as *professional expertise, flexibility, innovation and knowledge management, mobilization of human resources, international orientation, and entrepreneurship*.

In post-industrial societies characterized by the prominence of the service sector as opposed to the manufacturing sector, theoretical knowledge becomes central to innovation and policy formulation (Bell, 1999). The emergence of the knowledge society increases the demand for knowledge workers (Reich, 1992) whose tasks are complex, non-repetitive and non-routine (Autor, Levy and Murnane, 2003). They can therefore not easily be replaced by rule-based information and communication technology (ICT). Chapter 2 argues that in order to deal with the demands of the knowledge society, graduates need to be equipped with the skills necessary to fulfil tasks which are at the heart of knowledge work. This entails: 1) a specific body of knowledge (the knowledge needed to solve occupation-specific problems, 2) the ability to apply expert thinking (a collection of specific solution methods which vary with the problem at hand, Levy, 2010), and 3) broad academic skills (e.g. analytical thinking,

reflectiveness, and the ability to see the limitations of one's own discipline). We defined the combination of these three elements as professional expertise.³⁹

In the past 40 years, we have witnessed the emergence of a labour utilization system which increasingly combines a core labour force with externally flexible workers. Although university graduates have a higher chance of belonging to the valued core labour force than medium or low educated workers (DiPrete et al., 2006), an increasing number of graduates may have to deal with labour market related changes and uncertainty in the 21st century. Being flexible is one way of absorbing some of this uncertainty. In Chapter 2 we suggested that the following skills contribute to flexibility: 1) the ability to deal with changes and uncertainty, 2) the ability to learn new things, and 3) employability skills (e.g. the willingness to invest in further education and training and the ability to plan and take responsibility for one's own career).

The ICT revolution is probably one of the major drivers of the other trends identified in Chapter 2, such as globalization, the emergence of the knowledge society or the introduction of high performance workplaces (Bresnahan, Brynjolfsson, and Hitt, 2002). There is widespread consensus that the introduction of ICT into workplaces is skill biased – that it favours higher skilled workers. For repetitive, routine tasks – often performed by low and medium skilled workers – ICT can be seen as substituting labour as ICT is faster and cheaper than people in performing these tasks. With regard to knowledge work and professional expertise, however, ICT is mostly instrumental and complements labour (Levy, 2010). While knowledge work is not replaced by it, ICT nevertheless often changes the tasks associated with knowledge work and therefore impacts the skill demand of the highly skilled. Chapter 2 focused on ICT and its revolutionizing impact on the way data and knowledge is generated and diffused. It suggests that in order to manage, integrate and evaluate the vast amounts of data available today in a way that supports and facilitates innovation, graduates innovative/creative skills, ICT skills and implementation skills.

It is widely believed that traditional bureaucratic management stifles innovation and is ill-equipped for globalization – the strengthening and acceleration of world-wide interconnectedness. High performance work places are designed to make optimal use of the potential of knowledge workers by fostering team work, reducing hierarchical levels, and the delegation of responsibility to individuals and teams (Betcherman, 1997). As a result, high performance work places sets high expectations on the mobilization of human resources. Chapter 2 demonstrates that if knowledge workers are required to optimally mobilize their own and others' human capital, they need to have at least the following skills: 1) interpersonal skills (the ability to work in a team and communicate and cooperate effectively with diverse colleagues and clients), 2) self-management skills (the ability to work within budget and time constraints, leadership), and 3) strategic-organizational skills (the ability to act strategically towards the achievement of organizational goals).

Globalization has changed the world of work of graduates in many ways. In Chapter 2 we highlighted the extent to which globalization increases the demand for graduates' international orientation. Globalization is characterized by fast flows of ideas, financial capital,

³⁹ In Chapter 3 we use a slightly different definition of professional expertise, one which focuses on occupation-specific knowledge and skills, and which excludes broad academic skills. This was done in order to test the relative importance of these two components of professional expertise.

goods, services and people across national borders. As a result, a substantial proportion of graduates' regular customer contact, brainstorming and consultation with colleagues, and decision-making nowadays takes place across national borders or involves groups of people with diverse national backgrounds. The international orientation of today's work life requires graduates to have: 1) a good proficiency of foreign languages and 2) intercultural skills (the ability to work with people from different cultural backgrounds and the ability to adapt to new cultural contexts).

Over the last decades, the proportion of workers employed in small and medium enterprises has been growing. In combination with the flattening of hierarchies within firms and higher market uncertainty, this has increased demand for graduates who are comfortable with assuming responsibility and with contributing to the success of the organization through entrepreneurship. For high-wage countries whose key comparative advantage lies in the generation of knowledge and innovation, entrepreneurship, at the firm but also at the institutional level, is one of the main determinants of global competitiveness. Chapter 2 proposes the following components of entrepreneurship: 1) the ability to identify commercial risks and opportunities, 2) a good sense of cost awareness and 3) the ability to turn an idea into a successful product.

6.1.2 Which skills are most important in the graduate recruitment process?

Chapter 2 laid out how economic and organizational trends affect the demand for various types of skills. In Chapter 3 we tested the relative importance of a selection of these types of skills for graduates employability by eliciting employers' preferences in two discrete choice experiments. We were able to show that employers attach most value to CV attributes which signal a high stock of occupation-specific human capital indicating low training costs and short adjustment periods; attributes such as relevant work experience and a good match between the field of study and the job tasks. In line with the preferences for CV attributes, employers' actual hiring decision is mostly influenced by graduates' level of professional expertise and interpersonal skills. The latter finding emphasizes the role knowledge workers play in teams and networks, and indicates that occupation-specific knowledge and skills can only fully unfold their productivity in combination with interpersonal skills. Other types of skills, such as commercial/entrepreneurial skills or innovative/creative skills are also in demand but are found to be less important in the recruitment of recent graduates. They can therefore not easily compensate for a lack of more occupation-specific human capital and interpersonal skills. This finding indicates that while nearly all graduates need to possess professional expertise and interpersonal skills, other types of skills lend themselves to specialization and can be acquired by individuals according to their preferences and abilities.

6.1.3 How is students' personality related to their field of study choice?

Chapter 4 related measures of personality traits to young adults' field of study choice. Earlier studies have shown that expected life-time earnings as well as preferences for subject matters are important determinants of field of study choice (Berger, 1988; Flyer, 1997; Arcidiacono, 2004; Arcidiacono, Hotz and Kang, 2012; Wisfall and Zafar, 2013). As individuals with particular

personality traits a) enjoy some majors and related occupations more than others and b) are more productive in some majors and related occupations than others, I hypothesized that personality affects field of study choice. Supporting this hypothesis, Chapter 4 showed that the Big Five personality traits measured at age 14 have a significant influence on individuals' field of study choice some 4 years later. For both women and men, higher emotional stability decreases the probability of choosing Humanities in university. Moreover, for both women and men higher levels of extraversion are associated with a higher probability of choosing Law and a lower probability of choosing Science, Technology, Engineering or Mathematics (STEM) in university. In addition, higher levels of conscientiousness increase both women's and men's probability of choosing Medical Studies. There are, however, substantial differences in how women and men sort into fields of study based on their personality. This is most apparent for fields of studies such as Business, Economics, STEM and Medical Studies for which sorting of women and men seems to follow different rules. As elaborated by Turner and Bowen (1999), the reasons for this may be gender differences in the weights allocated to post-college opportunities or gender differences in labour market (dis-)incentives. For instance, the non-existent effect of disagreeableness on choosing Business or Economics in university for women is in line with Judge, Livingston and Hurst's (2012) finding that, due to conventional gender roles, the wage returns to disagreeableness are higher for men than they are for women.

In addition to investigating the relationship between individuals' personality and their field of study choice, Chapter 4 shed light on the relative importance of personality and cognitive skills in this process. While cognitive skills are the primary driver of the probability of entering university, the effects of personality traits and cognitive skills are similar (i.e. the differences not statistically significant) with regard to field of study choice. In the case of sorting into STEM fields for men, being introverted is even more important than having high information processing ability.

6.1.4 Which skills protect graduates against a slack labour market?

Chapter 5 examined how two aspects of professional expertise, field-specific and general academic skills relate to graduates' employability. The crowding out hypothesis predicts that, in case of excess labour supply, graduates with the lowest skill levels 'bump down' and get allocated to jobs for which no higher education degree is required. In line with this hypothesis, we found that the level of protection afforded by field-specific skills against the risk of overeducation is higher when the degree of excess labour supply in the occupational domain of the graduate's field of study is higher. Conversely, academic skills afford more protection against the risk of overeducation when excess labour supply in the overall labour market is higher. In accordance with the idea that the substitutability of the field-specific skills of graduates and the field-specific skills of workers with intermediate levels of education is subject to substantial limitations, we found that graduates with low field-specific skills have a higher probability of being unemployed than graduates with high field-specific skills. However, we did not find this effect for academic skills, supporting the idea that field-specific skills of graduates and lower-educated workers really differ in nature, whereas the

academic skills of graduates compared to those of lower-educated workers can be characterized as 'more of the same'.

6.2 Contribution and implications

In this section, I will highlight the main findings of this thesis. In addition, I will reflect on how strongly graduates' employability depends on decisions made by universities and students relating to the form and content of study programmes.

Low skills have dire effects on graduates' employability

One of the main findings of this thesis is its provision of new evidence for a logistic or concave relationship between skills and productivity. Graduates with low skills are very costly for employers and the productivity loss associated with hiring a graduate with low skills cannot be compensated by other team members with high skills (Chapter 3). Moreover, graduates' employability is strongly linked to their level of skills. These findings point to the existence of a minimum skill level which graduates need to possess with respect to each type of skill in order to be employable. Consequently, students have to consider their entire skill profile when making educational decisions. Students need to acquire at least the minimum level of each type of skill. They then can choose their specialization keeping in mind that some types of skill are more important for their employability than others.

The skill level employers consider to be the minimum in order for graduates to be employable varies with labour market conditions (Chapter 5). While graduates with higher skill levels always have a higher probability of finding a graduate job, this positive relationship intensifies when excess labour supply increases.

Professional expertise and interpersonal skills are most important for graduates' employability

A finding which runs like a common thread through this thesis is the salience of professional expertise for graduates' employability. The importance of professional expertise for adequately performing graduate job tasks stems from the emergence of the knowledge society and the primacy of theoretical knowledge in today's economy (Chapter 2). In contrast to the application of more pragmatic and contextual knowledge, knowledge work entails unstructured decision making. Unstructured decisions concern important, novel, non-routine problems for which no established procedure exists for how to solve them. Professional expertise – the combination of a specific body of knowledge, the ability to apply expert thinking and broad academic skills – is what enables graduates to adequately execute their jobs tasks which are complex, non-repetitive and non-routine. The strong position of graduates relative to other lower educated groups in the labour market can partly be traced back to the fact that they cannot be replaced by rule-based information and communication technology (ICT).

The results presented in Chapter 3 show, however, that professional expertise alone is not sufficient for graduates to be productive. Interpersonal skills are as important for graduates' employability as professional expertise and this strongly underlines the interdependence of knowledge workers in today's workplaces. Graduate work is characterized by a high degree

of information-sharing and communication, not only in management level jobs but also in non-management level jobs. In teams with wide-ranging responsibilities, graduates have to make shared decisions, and this demands graduates to be able to integrate well into teams, communicate effectively, and to seek advice, information and support when appropriate. Team members who do not have these skills present a serious threat to team productivity, which is reflected in the findings of Chapter 3.

Entrepreneurial, strategic and innovative skills mainly determine graduates' later career advancement

Entrepreneurial skills, strategic skills and creative skills affect recent graduates' employability less than professional expertise and interpersonal skills do. From the employer's perspective, these types of skills are not required for job tasks normally associated with entry-level positions. Rather, employers argue that these general types of skills are important for graduates' career development and their chances to get promoted to senior level positions. It may also be argued that these types of skills presuppose a deeper understanding about workplace and product related issues than university students can have. Consequently, these types of skills are more efficiently developed after graduates have gained a few years of work experience. This does not mean, however, that types of skills such as entrepreneurial skills, strategic skills or creative skills are irrelevant for graduates' initial employability. As pointed out earlier, belonging to the group with the lowest level of these skills severely works against graduates applying for junior positions (Chapter 3). Despite the dominance of professional expertise and interpersonal skills in the recruitment process, employers prefer graduates who have at least a basic notion of entrepreneurship, strategy, creativity and innovation. Furthermore, it is with regard to these latter skills that students can specialize according to their preferences and abilities, providing employers with a broad mix of skill profiles to choose from.

Short-term equals long-term employability

The discussion on *short-term versus long-term employability* is related to finding the right balance between graduates' specific knowledge and broad academic skills. The curricula of study programmes can of course allocate different weights to these components. The potential trade-off between short and long-term employability is based on the assumption that while specialized knowledge gives graduates an advantage in the transition from initial education to the labour market by being instantly deployable, broad academic skills enable workers to switch jobs or careers if their specialized knowledge becomes obsolete.

This study does not provide an unambiguous answer to the question whether occupation-specific knowledge or academic skills provide a better basis for long-term employability. On the one hand, the results of chapter 3 show that occupation-specific knowledge and skills are a stronger determinant of a good start of graduates' labour market career than broad academic skills. Quickly finding a job corresponding to the field of study may equip graduates with the occupation-specific experience and the training necessary to anticipate future market changes and to deal with them actively. Moreover, to the extent to which employers select graduates who are able to contribute to the organizations' long term success, the results of chapter 3 may reflect employers' belief that a good predictor of short-

term employability (e.g. high levels of occupation-specific knowledge and skills) is a good predictor of long-term employability. On the other hand, chapter 5 finds that academic skills are more important for graduates' chances of finding a graduate job when excess graduate supply is higher. While this finding may stem from the larger pool of graduates employers' can choose from when graduate unemployment is higher, it may also point to employers' need to recruit graduates able to find creative ways of securing a firm's survival in times of economic distress. There is therefore suggestive evidence that both types of skills are related to graduates long-term employability.

Employers' preferences are diverse

The employer for graduate employment does not exist. Skill demand in jobs differs due to the characteristics of the job. Moreover, skill demand differs because employers' exposure to the trends we identified in Chapter 2 varies. However, these differences in job characteristics and exposure to trends are not captured by firm characteristics commonly used to describe employers. For example, while employers attach most value to professional expertise on average, some employers have a strong preference for graduates with broad academic skills and find graduates' level of professional expertise less important. These employers may prefer employees who have high analytical skills and who can quickly acquire the firm-specific professional expertise they need through internal training courses. In this context, one might expect the preference for broad academic skills to be related to firm size, as larger firms may have more sophisticated internal training programmes and more resources to invest in new employees' initial work-readiness. However, employers' preferences for graduates' broad academic skills – and skill profiles in general – do not cluster according to firm size or any other of the background variables we collected, such as occupational field, economic sector, or the kind market the firm is operating on.

This diversity of employers' preferences has important implications for universities and students. I will elaborate on this in more detail below.

Abilities and labour market prospects are not the only factors influencing flows into technical fields of study

With regard to policies aimed at increasing the supply of graduates in fields of study such as Engineering that are considered crucial for economic development, the findings of this thesis suggest that it is important to take individuals' preferences for subject matters and work environments into account. For example, while cognitive skills such as math ability (for women) and information processing ability (for men) matter, sorting into Science, Technology, Engineering or Mathematics (STEM fields) is also substantially influenced by individuals' preferences for social interaction. Individuals who have the right math skills for technical studies but are more extrovert have the tendency to choose fields of study such as Law, where they expect higher rewards for their interpersonal skills and more opportunity to find the kind of social interaction they enjoy. The current trend towards increasing customer and client interaction in all occupations, also technical ones, may in the medium or long term attract more extroverted individuals to STEM fields of study. Until then, however, moderate monetary incentives, such as tuition-fee waivers in the Dutch context, will not substantially affect sorting into these fields of study.

Implications for universities

The findings of this thesis have important implications for universities. The significance of professional expertise and interpersonal skills for graduates' employability suggests that equipping students with these two types of skills should be considered a core task of initial higher education. Given the limited time available in higher education, this implies a trade-off with regard to the development of other types of skills, such as entrepreneurial skills. While universities should make sure that graduates possess a certain minimum level of, for example, entrepreneurial and creative skills, further investment in these types of skills may be more efficient and effective after graduates have gathered a few years of work experience. This notwithstanding, universities should foster ways of teaching which enable students to develop several types of skills at the same time, such as problem-based learning, so that the trade-off between professional expertise and interpersonal skills on the one side, and entrepreneurial and creative skills on the other side, does not occur.

Another important finding of this thesis is that employers' preferences are very diverse. This has important implications for the skill profile and the breadth of professional expertise universities and students should strive for. Both graduates and universities have to know their market well in order to make good skill formation choices. As *the* employer does not exist, there is no standard solution to the trade-offs implied in acquiring a particular skill profile. For universities, it is important to know which student flows they manage. On the one hand, this refers to keeping track of the kind of employers for which they educate graduates and the particular skill profiles these employers demand. On the other hand, universities face the challenge to align the skill profiles they are aiming to produce to students' preferences and abilities. With regard study programmes in STEM fields, for example, this means equipping individuals who are on average more introvert with the level of interpersonal skills demanded by today's graduate labour market.

Finally, while the policy debate on higher education often focuses on excellence and its role in innovation and economic development, the costs incurred by firms due to underperforming employees are substantial. The detrimental effect of low skill levels on graduates' productivity suggests that fostering graduates' excellence must not be the only focus of higher education, and that guaranteeing that graduates possess the required minimum level of skills may even be more important. Moreover, for graduates' transition from education to work to be smooth, universities have to provide graduates with qualifications which send a strong signal of employability to employers.

Implications for individual students

For individual students, the challenge is to choose their studies carefully. In this respect, prospective students, students and graduates have to be aware of the importance of a specific body of knowledge, the ability to apply this knowledge to novel problems, and the ability to work effectively in a team for their chances of getting a job within the envisaged field and at the adequate level.

Variation in the breadth of graduates' professional expertise has important implications for the job options available to them when entering the labour market. While a large specific body of knowledge increases graduates' chances to find a job within their field of study, high

levels of academic skills increase graduates' employability in the labour market segment in which productivity depends on general skills (Chapter 5).

The implications of employers' diversity for students in higher education are straight forward: employers demand a variety of graduate profiles which offers individuals some freedom with regard to educational and work-related choices. However, some graduate profiles are more employable than others and some trade-offs are worth making and some are not (Chapter 3). Employers base their hiring decisions on low adjustment and training costs. As a result, students should invest in the types of skills which give them a comparative advantage in the kind of jobs they envisage to work in, given their preferences and abilities.

Universities are intermediaries between students' preferences and abilities and employers' demands

In sum, my conclusions must not be misunderstood as a plea to negate any other purpose of university education but graduates' employability. This thesis is also not suggesting that young adults should be forced to acquire skill profiles which disregard their preferences and abilities. On the contrary. The literature on educational and occupational sorting, of which Chapter 4 forms part, emphasises the importance of a good fit between job tasks and individuals' preferences and abilities for productivity. Universities may be seen as intermediaries between students' preferences and abilities and employers' demands. Universities have a strong advantage over individuals with regard to access to information on employers' skill demand. From this advantage accrues an obligation to help students make good decisions about investments in their skill profile, even if this means limiting their choices. The main rationale behind this conclusion is straight forward: given the detrimental effects of unemployment and the inability of finding a graduate job on earnings, job satisfaction and other related life outcomes, universities serve young adults best when equipping them with the skills they need to have a labour market career which corresponds to their expectations. The challenge is to develop curricula and teaching methods which best integrate students' preferences and abilities into a skill formation process at the end of which will be employable graduates.