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ABSTRACT

Using Online Platforms for Competence Tests: A Component of the Demographic Policy of Germany*

Lifelong learning represents a key response to the demographic challenge in Germany. In terms of professional success, not only hard skills but also soft skills hold importance. Indeed, the OECD competence tests PISA and PIAAC have come to the fore, although acquired skills are still relevant. Given the increasing skills shortages and the reduced half-life of qualifications, training continues to gain importance, including in the context of employer branding and companies' corporate social responsibility activities. However, there is no linking of skills acquired through training with the automatic acquisition of qualifications. In this respect, online portals involving competency tests for young and old in connection with major credit points could play an important role.

JEL Classification: D83, I23, J11, J14, R20

Keywords: demography, lifelong learning, competencies, hard skills, soft skills

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1. Introduction

Harbingers of the demographic change have become increasingly apparent – in some cases, vacant apprenticeship posts cannot be filled anymore and skilled workers in several industry sectors and regions become scarce. It may temporarily help to activate job-seeking individuals from the hidden reserve, which is why the rate of employment is rising despite increasing numbers of unemployed people (see Bundesagentur für Arbeit 2014a). Moreover, it is reasonable to create incentives for the elderly, women and migrants to participate in the labor market or work longer hours than previously. Nevertheless, if the hidden reserve is exhausted, employment rates have reached a new record high and Germany experiences a net migration of 100,000 individuals per year, the demographic challenge will not be overcome according to all available simulations (see Spermann 2013). If Germany aims to maintain or even surpass the present level of prosperity – measured in GDP per capita –the productivity of the working population has to be enhanced. Highly qualified, exceptionally trained and working with the newest technology, lifelong learning represents the central solution to this demographic challenge.

The good news is that Germany's youth and adults are outstandingly competent. This was the quintessence of the global comparison of competences presented by the OECD in 2013. However, the bad news is that approximately 1.5 million young individuals between 25 and 35 years lack vocational qualifications.

This article examines the role of education and vocational training in Germany in the context of the demographic challenge. In chapter 2, we will show evidence of market failure on the professional training market. Nonetheless, despite the market failure, the quantitative importance of the education market in Germany has increased, as chapter 3 illustrates. In addition, professional training has gained more significance in terms of employer branding (chapter 4) and firms' corporate social responsibility (chapter 5), given the emergent shortage of skilled labor – the harbinger of demographic change. Furthermore, the results of the OECD competence tests PISA and PIAAC – which only measure hard skills – are presented in chapter 6. Subsequently, chapter 7 differentiates between hard and soft skills and draws attention to the importance of soft skills for professional success. Nevertheless, personnel managers of firms are still focused on professional qualifications: therefore, the relation between competences and qualifications will be emphasized in chapter 8. Although personnel managers rarely offer older employees a wide variety of training programs, chapter 9 makes it clear that training programs are reasonable, not only for younger but also for older employees. Hereafter, chapter 10 elucidates the opportunities

of using newer technologies within the context of training programs. Accordingly, the proposal of using online platforms for competence tests will be outlined in chapter 11, before chapter 12 summarizes the article and offers a brief outlook.

2. Market Failure in Education and Vocational Training

The professional training market is characterized by market failure due to external effects. Training programs are usually associated with positive external effects for third parties, given that employees cannot be forced to continue working for their employer. As soon as well-trained and educated employees leave the company, third parties benefit from the training experience. In other words, firms who offer training programs to their employees cannot completely internalize the revenues of that education, and thus they will offer fewer options for training than they would if they could harvest all the fruits of the training efforts for themselves. For this reason, the common business calculation results in economically suboptimal education possibilities. Based on the theory of external effects, the state is in a position to internalize the positive external effects through subsidies, which can thus explain the state support of professional training opportunities through subsidies, such as educational vouchers and further training premiums.

3. Assessment of Competence in the Education Statistics

Looking at the education statistics, however, gives the impression that training programs in companies have gained importance in recent years, notwithstanding the market failure. According to data of the Institut der deutschen Wirtschaft Köln (IW), firms spend an overall amount of 28.6 billion euros for the further training of their employees – 6.4 percent more than in 2007 (see Seyda/Werner 2012). The authors apply a wider definition of professional training, which also includes informal measures such as workplace instructions, informative events and computer based learning. The IW-professional training survey is based on an online questionnaire for firms, whereby 30,000 companies were contacted and 2,254 participated in the survey.

In terms of a global comparison, the Adult Education Survey is the most helpful. According to that survey, the German participation rate in training measures reached a peak of 49 percent in

2012, placing Germany in the upper-middle range, above the EU-27 average (vgl. Bilger et al. 2013).

4. Professional Training and Employer Branding

Professional training could play a greater role in the future since the demographic change and rapid technological developments increasingly result in a shortage of skilled labor. Additionally, we observe a change in the values of the employees, whereby payment is no longer the only determining factor for young adults; rather, they also take other economic conditions into account, such as career development opportunities through professional training.

Companies react to the developments with so-called employer branding. Carving out a specific employer brand is not exclusively a marketing tool. Elaborately staged campaigns for attractive employers only pay off if the words are followed by actions. Thus, employee recruitment and inclusion has to be in accordance with the employer brand. So-called corporate universities, which can be found among many large firms, reflect the working population's increased demand for training and further education. The term corporate universities encompasses a number of different concepts contributing to the internal professional training within companies. A practical example of a medium-sized firm that wants to appear as an attractive employer is the enterprise Trumpf in Ditzingen. For example, an account for “family and training” is set up for every employee which can be filled with up to 1,000 hours and may be used on a block-by-block basis (see Heckel 2013a).

5. Training Programs and CSR

We can also derive professional training activities that have consequences for employee loyalty from the corporate social responsibility (CSR) perspective. When the bonds between employees and employers become stronger as a result of CSR projects, the job tenure in the company increases (see Idowu et al. 2013). For example, the personnel service provider Randstad focuses on the development of talents in their CSR measures. Through the Randstad Academy, professional training opportunities are offered to temporary workers, which go hand in hand with increasing job tenure, without being able to ascribe a causal interpretation (see Spermann 2008 and Randstad 2011).

However, in the context of the Corporate Sustainability barometer 2012, it became evident that the workforce of large German firms are only qualified to a small extent to effectuate sustainability policies. Personal skills was considered the most important competence for implementing such measures (see Schaltegger et al. 2012).

6. PISA and PIAAC: Evaluation of Competences on the Rise

More professional training programs should be associated with more competences. In recent years, the OECD has most vehemently highlighted the importance of competences as opposed to formal qualifications. Casually speaking, it is important what people are able to do, rather than what kind of qualifications they can list on their CVs. “Competences are the global currency of the 21st century”, as the general secretary of the OECD argued in the publication “OECD Skills Strategy” (OECD 2012).

Probably the best known trial measuring competences of adolescents is the PISA (Programme for International Student Assessment) study, which was first released in 2001. The first PISA study quantified the fundamental competences of 15-year olds and proved Germany’s extensive underperformance in terms of competences in an international comparison (see Baumert et al. 2001). The PISA study sparked broad public discussion, with the so-called PISA shock kindling a collective ambition to improve the outcomes.

Indeed, a continuous improvement in the following evaluations could be observed in terms of competences. According to the latest PISA study, published in 2013, Germany has clearly exceeded the average OECD level in mathematics, reading skills and natural sciences (see OECD 2013a,b). A general rule of thumb is that a disparity of 30 points approximately represents what a pupil learns in one school year, making the progression in mathematics (+ 24 points), reading skills (+ 24 points) and natural sciences (+ 37 points) between 2000 and 2012 even more astounding.

According to the PIAAC (Programme for the International Assessment of Adult Competencies) study, which measures key competences of adults (between the ages of 16 and 65), Germany slightly exceeds the OECD average (see OECD 2013c and Rammstedt 2013). Germany’s levels in mathematical literacy and computer skills proved to be above the OECD average, whereas only reading comprehension was slightly below the average. Thus, the PIAAC shock did not take place. However, it is alarming that more than half of all people who have a German Hauptschulabschluss (high school diploma) or less only possess very limited core competencies.

Nevertheless, it should be noted that the OECD competence tests concentrate on easily measurable hard skills.

7. Examining Hard and Soft Skills

The OECD competence tests almost exclusively focus on hard skills in terms of reading, mathematics and natural sciences, which are easily measurable. Regarding the labor market, it is undisputed that these skills are a necessary condition for the professional success of individuals. Illiterates and people who are unfamiliar with the four basic calculation methods are often not even deployable for auxiliary work in the labor market. However, newer insights of labor economics and psychology verify that cognitive skills are not a sufficient condition for professional success. IQ-tests, diplomas and cognitive competence tests fall short of predicting labor market success. Heckman/Kautz (2012) estimate that cognitive skills only account for approximately 15 percent of the success in the future working life. By contrast, non-cognitive skills (character skills) such as perseverance and motivation are crucial for sustainable success in the labor market. Moreover, these competences are not unchangeable character traits, but rather can be developed over the life-cycle (see Heckman/Kautz 2013).

According to the principle of OCEAN or the Big Five concept, psychologists differentiate between openness, conscientiousness, extraversion, agreeableness and neuroticism. It shows that conscientiousness is regarded as the most important soft skill in terms of different professional success criteria, (see Heckman/Kautz 2013).

Therefore, how should the OECD competence test be assessed in the light of the newer insights concerning soft skills? It is important to understand that competence tests measure the results from hard and soft skills. For this reason, youths and adults who are more open to new experiences or show a higher academic motivation will perform more successfully in the competence tests (see Heckman et al. 2013).

8. Acquiring Skills and Foster Competence-Building

Certified qualifications acquired within vocational education and training systems have dominated the OECD and Germany in particular for years (see OECD 2011, chapter 4). Without professional

qualifications or school certificates, employees can only find work as unskilled, auxiliary personnel in the labor market, even if they possess extensive expertise or excellent competences. However, prominent college dropouts who later founded global companies (such as Bill Gates and Steve Jobs) have contributed to soften the focus on certified qualifications. Undoubtedly, the OECD has substantially helped to rethink the situation with the PISA and PIAAC tests. In 2012, the OECD formulated a competence strategy that has slowly been making its way towards the member states (see OECD 2012).

Against the backdrop of roughly 1.5 million young adults between 25 and 35 years who do not have a professional qualification (see Bundesagentur für Arbeit 2013a), the discussion in Germany about acquiring qualifications and competences seems to have gained momentum. The Federal Employment Agency has pledged to achieve their goal of supporting 100,000 youths in obtaining vocational qualifications in the context of the demographic strategy of the Federal Government: in 2013, more than 32,000 young adults of that age group started vocational training (see Bundesagentur für Arbeit 2014b).

However, the obstacles for young people lacking professional qualifications are often too high to begin a dual vocational training. For this reason, the Federal Employment Agency has experimented with “compatible professional sub-qualifications” and a procedure to identify individual competences in a model test (see Bundesagentur für Arbeit 2013b). Defining the compatible professional sub-qualifications includes training modules of the federal program JobstarterConnect for fourteen different job trainings (www.jobstarter.de), as well as the pilot initiative of the Association of German Chambers of Industry and Commerce (DIHK), which seeks to certify partial qualifications (see Hartwich et al. 2013). Likewise, the Confederation of German Employers' Associations (BDA) underlines that lifelong learning as a continuous advancement of qualifications during the entire employment history is crucial for favorable prospects in the labor market, including in old age (see BDA 2013). The German Association for People Management (DGFP) and Human Resources Alliance (HR Alliance) has recently published a memorandum about future economic prospects due to professional qualifications, advocating a more flexible dual vocational training system so that academically weaker students, including socially and educationally disadvantaged youths, are given the same opportunities. For instance, the Bertelsmann Foundation has long emphasized that “people do not exclusively learn in schools and universities; they are also trained in the workplace, in associations, and political organizations, within the family, during leisure time and in the community” (see Bertelsmann Stiftung 2010). In addition, the Federal Ministry of Education and Research (BMBF) has taken up the issue and organized the first “Professional Training in Discussion” event in 2012, which took place for the second time in March 2014 (www.alphabund.de).

9. Training for the Old and the Young

Further training at the corporate level is often withheld from older employees, as it supposedly does not pay off economically anymore (see Seyda/Werner 2012). Nonetheless, it is indisputable that people are able to learn new things into old age. However, in order to do so, certain framework conditions have to be met: after decades of condemning the work performance of older employees, recent empirical insights have revealed that productivity does not rapidly deteriorate with increasing age. For example, Göbel/Zwick (2009) demonstrated that a company's productivity level continuously increases with the share of employees between 50 and 55, and only drops slightly thereafter.

Working and learning collaboratively in mixed teams where young and old employees work together can prove productive for both sides, whereby the experiences of the older employees complements the school and university knowledge of the younger workforce (see Göbel/Zwick 2013). A long-term study of such mixed teams in companies such as DaimlerChrysler and BASF, which measured the productivity of employees on the basis of error rates, illustrated that although younger employees make fewer mistakes than older workers, the former also caused more extensive damage (see Börsch-Supan/Weiss 2013). Axel Börsch-Supan, the senior researcher of the study, reasoned that "the productivity of older employees is eventually higher than that of younger colleagues"(see FAZ am Sonntag v. 28.4.2013). Moreover, mixed teams result in longer employment periods for older employees (see Boockmann et al. 2012).

It is often said that older people learn differently: younger individuals supposedly absorb knowledge like sponges, while older people need a goal to learn (see Heckel 2013a, p. 27). Unquestionably, physical and mental activities as well as social interactions in old age help to preserve cognitive skills (see Falkenburger 2009). According to Stamov-Roßnagel, learning ability does not decrease, but merely the learning pace (see Die Zeit v. 28.11.2013). In contrast, a recent study concludes that elderly people have a harder time absorbing knowledge than their younger counterparts, because the former have accumulated and memorized more knowledge in the course of their lifetime (see Ramscar et al. 2013). Other authors claim that people can uphold a passion for learning into old age (see Endres/Hüther 2014). Moreover, the statement that appreciation is the driving force of learning achievements among the elderly is often made (see Heckel 2013a). It can clearly be said that there are many hypotheses regarding "learning in old age" that need be verified empirically.

In contrast, it has been empirically proven that education measures should start at an early age. This is the core insight of a decades-long evaluation of the Perry program, which was created to

support 3- to 4-year-old American children with an African migrant background and lower IQ. A program and control group was scientifically observed until the age of 40, with the results proving that participants of the Perry program showed significantly better outcomes in their adult life in terms of education, employment, income and health compared to the control group. Even the IQ of participants increased for a short amount of time, although the effect was only temporary. Nevertheless, the soft skills of the participants increased permanently, thus improving their perspectives in the labor market. The political consequence was that the Perry program is now applied in approximately 30 percent of American pre-school establishments (see Heckman et al. 2013).

10. New Technological Advancements Change the Face of Learning

People are increasingly acquiring knowledge online, using Wikipedia to gain knowledge instead of looking it up in the Brockhaus or watching videos on YouTube rather than reading pages of operating manuals. Modern technologies have even rendered mobile learning on the internet possible, whereby smartphones and tablet computers featuring special apps offer new possibilities for learning regardless of time or location. As opposed to unimaginative e-learning, playful learning through so-called serious games may become increasingly important. However, while market is in a state of flux, the choice of products is still very limited (www.learntec.de). Furthermore, recent technological advancements regarding artificial intelligence are underway (see Igel 2014).

Digitization has also reached universities. Indeed, Gräger (2013) even postulates that a revolution is in full swing: “a system which has remained largely unchanged for centuries is about to experience a great upheaval”. A few years agoso-called “Massive Open Online Courses” (MOOCs) evolved, particularly at American videos, where videos of lectures are usually available online for free. Internationally known providers include Coursera, Khan Academy, edX, Udacity and itunesU. Moreover, the internet also has the potential to massively increase the number of students, enabling a lecture given by a famous professor at a world-class university to become accessible to millions of students. At present, two MOOCs are offered by the German provider Iversity, which was founded in 2011. After successfully completing an online class on this platform, participants are awarded ECTS credits (European Credit Transfer and Accreditation System) (see WISU 2013).

Newer technologies are SPOCs and POOCs – there is no lack of abbreviations. On the one hand, Personalized Open Online Courses (POOCs) offer an individual education program (see Dräger 2013); on the other hand, Small Private Online Courses (SPOCs) are fee-based online courses for small groups of students (see WISU 2013). Some disagree with such an individualization of the online education programs, arguing that learning is a social process, whereby you need teachers to teach (see Lankau 2014). However, we can definitely observe a shift from offline to online contents in the United States (see Economist 8.2.2014). This trend is inexorably moving towards online learning. The combination of offline and online contents, individual studies and group work, lectures or tutorage, coaching and mentoring essentially depends on the competences that should be acquired, as well as the age of the students. Accordingly, a "one size fits all" solution is not appropriate.

11. Online Platforms for Competence Tests – A Proposal

Parents and grandparents are usually familiar with Antolin (www.antolin.de). Behind the name is an online reading skills platform for pupils of primary school (1st to 4th grade) and secondary education (5th to 10th grade). The students read selected, upscale children's and teen books that they can borrow in public libraries, for example (with the sticker Antolin). Subsequently, they take online tests posing questions regarding the titles, for which they are awarded reading credits. The more difficult the book is, the more points are awarded. Licenses for classes and schools enable teachers to individually promote reading skills.

Online platforms for reading skills, mathematics and natural sciences in combination with credit points for training activities could increase the visibility of acquiring informal competences. The vision is that in the context of the demographic strategy of the Federal Government, online platforms will be constructed for all age cohorts against the backdrop of experiences made with PISA and PIAAC competence tests. It is crucial that the acquired scores in terms of reading skills, mathematics and natural sciences automatically result in credit points, thereby leading to certified degrees. The German Qualifications Framework for Lifelong Learning (DQR), which was jointly decided by the Federal Government and the *Länder*, makes qualifications comparable throughout Europe. The DQR is a well-considered concept that could be further developed to include competences (for example soft skills) that are relevant for the labor market (see Bundesministerium für Wirtschaft und Technologie v. 16.5.2013 and

www.deutscherqualifikationsrahmen.de). However, setting up online learning platforms and linking them with DQR is a mammoth project that can only be realized in a period of ten years.

12. Conclusion and Outlook

Even if the willingness to participate in education and vocational training measures is statistically recorded, lifelong learning is mostly only a catchphrase. Nonetheless, in relation to standard vocational training in Germany, further training programs are more important than ever. As the professional life begins sooner in times of G8 graduations and Bachelor's degrees and without the obligation to undergo military training, and ends later due to retirement at age 67, the topic of further education and vocational training plays an important role for approximately five decades of a person's life. However, present labor market institutions are only rudimentarily prepared for this, with Germany still far from having a culture of lifelong learning and a systematic development of hard and soft skills of potentially employable individuals. The foundations for such a culture could be developed in the context of the Federal Government's demographic strategy.

The central solution for the demographic challenge is to enable lifelong learning for the young and old (see Spermann 2013). At the same time, there is good news: we know that hard skills and soft skills are modifiable into old age, and there are new technologies that offer learning with fun regardless of time or location. Thereby, unforeseen opportunities arise for education and vocational training. In addition, a combination with recognized qualifications is inalienable. This approach has been pioneered in the last couple of years, thus improving the permeability of the educational system in Germany. While the so-called 'second chance' learning was possible but a hard road a few years ago, today it rather resembles a paved road. For example, with the German Qualifications Framework a Master Craftsman's Certificate is equated to a Bachelor's degree – both measure up to a level 6 education (see Bundesministerium für Wirtschaft und Technologie 2013). For this reason, a master's degree program can be pursued even if the applicant does not have a school diploma corresponding to university entrance level, e.g. the Abitur.

However, that is by no means enough. In this article, we have proposed using online platforms for competence tests for all age cohorts in combination with a credit points system for further training. Keeping records of people's abilities and automatically transferring these documented competencies into qualifications is in line with the OECD competences revolution that has reached Germany to some extent – and it is of crucial importance in the light of the demographic

challenges. Against the backdrop of market failures in the professional training market, it is an essential task for the government to create a suitable framework for vocational training in Germany.

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