

FROM CERTIFICATES TO PERFORMANCE: A PARADIGM SHIFT AND ITS CONSEQUENCES FOR HIGHER EDUCATION RESEARCH

DE LOS CERTIFICADOS AL DESEMPEÑO: UN CAMBIO DE PARADIGMA Y SUS CONSECUENCIAS PARA LA INVESTIGACIÓN EN LA EDUCACIÓN SUPERIOR

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ABSTRACT

Against the backdrop of recent social and technological developments, the relationship between the educational system and the employment system has also changed. The “lifelong learning” paradigm is now firmly established within the field of educational research. In this article, we argue that empirical researchers have shifted using certificates to capture educational attainment, focusing instead on competence and performance. We define “performance” as the ability to react adequately and flexibly to new situations within job-related contexts. This paper thus aims to describe the shifting research paradigm in the context of political agenda-setting and presents some examples from different disciplinary perspectives to illustrate the potential of interdisciplinary research. Interdisciplinary, collaborative research, we suggest, shows great potential for providing empirical evidence to measure the consequences—intended and unintended—of political reforms in higher education. Even though our arguments and implications are formulated from the perspective of the German education and science system, their essence can also be applied to other national contexts.

Key words: Bologna process, collaboration, Copenhagen process, educational certificates, European dimension, evidence-based policy, Germany, interdisciplinary research, paradigm shift, performance-based assessment.

RESUMEN

A raíz de los cambios sociales y tecnológicos de los últimos tiempos, se ha transformado también la relación entre el sistema educativo y el sistema laboral. Hoy el paradigma del “aprendizaje permanente” está afianzado en el campo de la investigación educativa. En el presente artículo argumentamos que los investigadores empíricos han pasado de valerse de certificados para reflejar el nivel educativo a enfocarse en la competencia y el desempeño. Definimos “desempeño” como la capacidad de reaccionar de forma adecuada y flexible ante situaciones nuevas en contextos relativos al trabajo. Este trabajo pretende describir el cambio en el paradigma de la investigación en el marco del establecimiento de la agenda política, y asimismo ilustra las posibilidades que ofrece la investigación interdisciplinaria presentando ejemplos de diferentes perspectivas disciplinares. A nuestro entender, la investigación interdisciplinaria y colaborativa encierra un gran potencial para aportar pruebas empíricas para medir las consecuencias —previstas e imprevistas— de las reformas políticas aplicadas a la educación superior. Si bien nuestros argumentos e inferencias han sido formulados desde la perspectiva del sistema educativo y científico alemán, su esencia también ha de poder aplicarse a contextos de otros países.

Palabras clave: proceso de Bolonia, colaboración, proceso de Copenhague, certificados de estudios, dimensión europea, política con base empírica, Alemania, investigación interdisciplinaria, cambio de paradigma, evaluación basada en el desempeño.

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INTRODUCTION

Since the end of the last century, numerous social and technological changes have taken place within western, industrialised countries, that have greatly impacted education, the labour market, and the interplay between them (Chapman & Aspin 2013; Enders, De Boer, File, Jongbloed, & Westerheijden 2011; Rychen 2001). These shifts have resulted in at least three major developments: ongoing (rapid) educational expansion, demographic changes, and the rapid digitalisation of society. Even if these trends are global, they affect education and science systems at the national level. Based on our background, we therefore primarily argue against the German context.

Around the world, *educational expansion* on a dramatic scale has led to an increase in the number of graduates, especially within the higher education sector (Marginson 2016; OECD 2020; Schofer & Meyer 2005). In 2016, there were 19.6 million students enrolled in tertiary education in the European Union (Eurostat 2018). Within countries belonging to the Organisation for Economic Co-Operation and Development (OECD), the amount of students increased, on average, about 20 per cent between 1998 and 2012 (OECD 2018: 75). If the majority of potential employees hold a higher-education degree, tertiary certificates alone will no longer provide reliable signals for individual productivity on the competitive labour market (Spence 1974). An individual's knowledge and skills, motivation, and attitudes have become more important factors for finding employment. Educational expansion is also directly connected to increased (vertical as well as horizontal) diversification on the institutional level within higher education (Huisman, Meek & Wood 2007; Krücken, Kosmützky & Torck 2007; Shavit, Arum & Gamoran 2007). While diversification has increased, so too has heterogeneity among students, with respect to previous educational trajectories and personal characteristics, such as social background and age.

In terms of *demographic change*, low birth rates and an aging population are two issues confronting countries outside and within the European Union (Harper 2014; Höhn, Mai & Micheel 2008). These issues are compounded by the fact that the workforce is expected to meet ever-greater demands for maintaining a certain standard of living. Increased migration to countries within the European Union will not solve these problems. These aging societies and, at the same time, the expanding knowledge-based services increase the need for a highly skilled workforce.

A third major development is the "*digital revolution*", a term that refers to the introduction and spread of digital technology that began in the mid-twentieth century, and the technological progress shapes the content and nature of work. The worldwide pandemic caused by Sars-Cov-2 that is currently still ongoing has even accelerated this process of digitalization (Oldekop et al. 2020)—for companies (Almeida, Duarte Santos & Augusto Monteiro 2020) as well as higher education institutions (Skulmowski & Rey 2020). The digital revolution has introduced new professional fields and fundamentally altered learning/working places and learning/working times. In addition to these more direct consequences on the nature of work, the accessibility and ubiquity of information has also impacted individual learning processes, strategies, and opportunities. Germany has been accused of lagging behind other nations, in terms of implementing and adopting digital technology (BMBF 2016). It has invested too little in infrastructure, technology and training, neglecting older members of the population and people living in rural areas in particular (OCED 2018; OECD 2019).

These fundamental social changes present challenges that will have to be tackled—on the international and national level—in the very near future. It's for this reason that state leaders have already put them high on the political agenda; the European Council's "Lisbon Strategy," for instance, aims to make Europe the "*most competitive and dynamic knowledge-based economy* in the world capable of sustainable *economic growth* with more and better jobs and greater *social cohesion*" (European Council 2000, emphasis added). Such insights are based on the notion that knowledge and information will stimulate economic growth, ensure social stability, and provide individuals

with the resources that they need to participate on the labour market and to act as responsible citizens over the course of their lives (Kearney & Huisman 2007; Schuetze & Slowey 2013). Against the background of global social changes on the one hand and the special German context on the other hand, our paper investigates the observable paradigm shift from an emphasis on formal certificates towards more general and flexible learning outcomes. The remainder of the paper is structured as follows: We begin by briefly reviewing two international reforms and how they promote amplified emphasis on learning outcomes. Afterwards, we describe the postulated shift in research on higher education in particular. We provide definitions that are applicable to research and policy. We also briefly summarize and discuss different ways to assess these performance-based learning outcomes. In the following section, we compare discipline-specific perspectives and approaches with assessment in learning outcomes to provide a general overview of how they have contributed to the creation of interdisciplinary research. It is beyond the scope of this paper to reconstruct in detail the emergence of this interdisciplinary, performance-oriented research paradigm or to provide more than a cursory account of existing evidence from various academic disciplines. We focus instead on examining potential developments for further interdisciplinary research in higher education, while also considering its limitations. Finally, drawing on empirical evidence, we consider the possible consequences of applying the results of this research to higher education research and policy.

INTERNATIONAL REFORMS AND NATIONAL EDUCATION SYSTEMS

In an effort to build up a European Area of Education, forty-eight European countries have introduced reforms to their educational systems, the most significant of which is the “Bologna Process.” With the professed goal of aligning cycles of study between the different countries, the Bologna Process has completely restructured higher education—particularly in Germany (Bologna Declaration 1999; Broucker et al. 2019). It has impacted not only educational certificates in the course of structural convergence, but also the curriculum, by stressing the acquisition of competence and learning outcomes (Jaudzims 2013; Karseth 2006). The logic behind this shift in emphasis is that the more generic and flexible these outcomes, the better suited individuals are to cope with the constantly changing labour-market demands. The “Copenhagen-Process” takes a similar stance as part of the vocational education and training system (Ante 2016; Copenhagen Declaration 2002). Using a credit point system, vocational education and training makes occupational skills, competences, and qualifications transparent and comparable between countries and educational sectors.

Table 1: Comparing Bologna Process and Copenhagen Process

| | European dimension: Comparability between countries and their educational systems | |
|------------|---|--|
| | Bologna-Process Established 1998/1999 | Copenhagen-Process established 2002 |
| Domain | Higher Education (HE) | Vocational Education and Training (VET) |
| Objectives | Adoption of a system of easily readable and comparable degrees Adoption of a system essentially based on two main cycles Establishment of a system of credits Promotion of Mobility Promotion of European co-operation in quality assurance Promotion of the necessary European dimensions in higher | Strengthening the European dimension in VET Transparency, information and counselling Recognition of competences and qualifications Cooperation in the field of quality assurance |

| | education | |
|---|---|--|
| Follow-Up Meetings | <ul style="list-style-type: none"> - Prague (2001) - Berlin (2003) - Bergen (2005) - London (2007) - Louvain-la-Neuve (2009) - Vienna & Budapest (2010) - Bukarest (2012) - Yerevan (2015) - Paris (2018) - Rome (2020) | <ul style="list-style-type: none"> - Maastricht (2004) - Helsinki (2006) - Bourdeaux (2008) - Brugge (2010) - Riga (2015) - Osnabrück Declaration 2020 |
| Number of participating countries in 2021 | N = 48 | N = 35 |

Source: Own illustration.

Table 1 above compares the main objectives of the two—the Bologna and Copenhagen—reforms. Both were introduced at roughly the same time and share similar goals: making learning outcomes comparable and ensuring a high standard of quality (Powell, Bernhard & Graf 2012). Because both initiatives are located on the European level, on the national level, participating countries have to implement them by making use of soft laws (Trubek, Cottrell & Nance 2011). To ensure that participating members are making progress on meeting identified goals, they meet every other year (Orr, Gwosc & Netz 2011: 228).

Both political initiatives are located at the international level. However, they have different meanings at the national level for different countries. Germany, for example, is particularly known as a country with a higher education system in the tradition of Humboldt on the one side (Hüther & Krücken 2018; Liebeskind 2019) and a distinctive vocational education and training system on the other side (Protsch & Solga 2019). Thus, restructuring as the consequence of political agenda setting has been wide-ranging. More specifically, traditional one-cycle degrees like “diploma” or “state examination” have been replaced by “new” certificates based on the model of bachelor and master system.

FLEXIBLE LEARNING OUTCOMES: FROM CERTIFICATES TO PERFORMANCE

International political actors like the OECD and the EU Commission have placed the “lifelong learning” paradigm on their political agenda (Harmsen & Braband 2019; OECD 2001; European Council 2000). Rejecting the traditional sequence of “education-work-retirement,” this paradigm shifts from a model of education based on formal certificates, education, and training attained at an early stage in life to one centred on dynamic knowledge acquisition that continues to take place throughout a person’s life (Blossfeld, Roßbach & von Maurice 2011; Colardyn & Bjornavold 2004; Kyndt, Dochy, & Nijs 2009). This shift in emphasis has impacted institutions of higher education in particular; they are now seen as places for learning and for the transfer of knowledge to individuals from various backgrounds at different stages in their lives (Frank & Meyer 2007; Trow 2007). As part of these changes, recently there has also been a growing interest in further education (OECD 2019). Taken together, this paradigm and consequent developments in education reform emphasise education at the tertiary or postsecondary level.

Alongside changing notions of education, the notion of knowledge acquisition itself has also changed. In the past, most people viewed knowledge as relatively stable; educational institutions could verify of its attainment through certificates. In the past two decades, however, traditional notions of knowledge and education have, however, given way to new ones centred on a more fluid notion of knowledge as ongoing and as acquired through the development of competences and a degree of flexibility (Blömeke, Gustafsson & Shavelson 2015; Braun & Mishra 2016). As such, “competencies can be understood as *cognitive abilities and skills*. These include all of an

individual's resources that are used to master challenging tasks in different content domains, to acquire necessary declarative and procedural knowledge, and to achieve *good performance*" (Weinert 2001: 46, emphasis added). Since knowledge as well as labour-market requirements are changing, one aim of education is to enable individuals to handle challenging tasks, learn continuously, and react appropriately in (relatively) unknown situations (Green 2012; Heijke, Meng & Ris 2003). Generic, flexible competences will therefore supplement domain-specific knowledge.

In response to this change in perspective, research education has likewise adopted a new paradigm, shifting from a focus on educational certificates towards competences. To take an example from higher education research, a recent international survey, "Flexible Professional in the Knowledge Society (REFLEX)," (Allen & van der Velden 2011) looked at graduates' competences, skills, and labour-market requirements. In addition to professional expertise, as already expressed in the study's title, one of the core concepts was "*functional flexibility*"—meaning the "*ability to adapt to changes* in the environment" (ibid. 4f., emphasis added). Studies such as this, make evident that the "lifelong learning" paradigm is oriented to the (future) labour market and to its requirements for flexibility. The study's questionnaire contained grades and self-ratings of competences to assess graduates' skills (Allen & van der Velden 2005)—accentuating differences among holders of the same level of education.

As a result, a key criterion for measuring the relative quality of education is the different outcomes of higher education. As part of this assessment, in the field of education and learning a central question has emerged: how do you measure these learning outcomes, once they have been clearly defined (Zlatkin-Troitschanskaia, Shavelson & Kuhn 2015)? One approach is to understand learning outcomes based on different system-levels, ranging from the micro-, meso-, and macro-levels (Braun, Weiß & Seidel 2014). On the micro-level, some scholars connect learning success with diverse returns, such as the successful transition into the labour market, the development of a general vocational career, and the gain of non-monetary profit (Gebel 2009; Mirowsky & Ross 1998; Lochner 2004). On the meso-level, other scholars evaluate institutions in terms of how effective they are in the transmission of educational and competence attainment (Coates 2005; Tam 2001). On the macro-level, most researchers focus more on legitimations (Liefner 2003; Olsen 2007) than on outcomes, such as linking attained knowledge and skills with economic growth and general well-being. In an international comparison, Hanushek & Woessmann (2008), for instance, demonstrate the close connection between a given country's overall level of competences and its economic performance.

A PERFORMANCE PERSPECTIVE ON DEFINING LEARNING OUTCOMES

Merely citing research from different disciplines draws attention to another distinction. Depending on the field, researchers differ as to whether they employ the term "competences" or "skills" (compare Table 2). Weinert (2001) notes that part of the problem is that in the past, in particular, scholars have sometimes neglected to clearly define the assessed, underlying concept to which terms like "competences" and "skills" refer. As a result, the measurements that they employ capture different core concepts. What's more, only very recently have scholars begun to reflect more rigorously on the implications of their chosen methodology (Braun & Mishra 2016; Suleman 2016; Zlatkin-Troitschanskaia, Shavelson & Kuhn 2015). Blömeke, Gustafson & Shavelson (2015) introduced a concept of modelling competences as a continuum between cognitive and affective-motivational "disposition" and real-life "performance," rather than a pure dichotomy. Hence, research on competence focuses not only on its discipline-specific aspects (e.g., factual knowledge). It also includes those competences that enable graduates of vocational and higher education to successfully handle and manage new and complex situations—for example the interpretation of a situation and the decision-making process. By taking into account

these situational aspects, knowledge is transferred into performance. Accordingly, Masten and Coatsworth (1998: 206, emphasis added) define competences as

“a pattern of *effective adaptation to the environment* ... broadly defined in terms of reasonable success with major developmental tasks expected for a person of a given age and gender in the context of his or her culture, society, and time ...”.

This definition emphasises not so much outstanding achievement as good adaptation to a variety of situations. As such, the goal of education and training goes beyond imparting discipline-specific, expert knowledge; it seeks to foster skills that enable graduates to become effective citizens, who can contribute equally towards their personal, professional, and social lives (Chan, Brown & Ludlow 2014).

At the same time, scholars are developing new methods for assessing competences and skills in ways that make it possible to observe and measure these complex abilities (Zlatkin-Troitschanskaia, Shavelson & Kuhn 2015). Traditionally, educational success was indicated by educational degrees, implying that certificates could guarantee a certain level of individual knowledge. National and international educational classifications are based on this vertical differentiation between different educational levels (e.g., CASMIN or Comparative Analysis of Social Mobility in Industrial Nations; ISCED or International Standard Classification of Education). To differentiate on a horizontal dimension, grades function as indicators of performance differences within the same level of education. The comparability and signalling value of higher education grades has been the object of intense debate (Eiszler 2002; Johnson 2006). The phrase “grade inflation” refers to the increased assigning of very high marks without a commiserate increase in individual knowledge (Hu 2005). Grades tend to reflect an individual’s knowledge not their ability to perform in challenging situations.

A MULTIMETHOD PERSPECTIVE ON ASSESSMENT OF LEARNING OUTCOMES

With these issues in mind, several major research initiatives have been launched with the aim of exploring new ways to identify real performance differences within the same level of certificates. Braun and Mishra (2016), to cite but one example, have identified different approaches for assessment in educational research, such as (i) *certificates* (degrees and grades) and (ii) *performance* (self-reports, achievement tests, and simulation methods). Every type of measurement captures different core-constructs. In Table 2, using the idea of assessing learning outcomes, we apply these different approaches.

Table 2: Comparing different approaches for assessing learning outcomes

| | A paradigm shift: from certificates to performance | | | | |
|--------------------------|--|---|--|--|---|
| | Certificates | | Performance | | |
| Indicator | Degree (years of schooling) | Grades | Self-reports (questionnaires) | Achievement tests | Simulations |
| Item example | <p><i>Question:</i> “What was the type of qualification”</p> <p>Possible answers: “Bachelor/ Master/ others”</p> | <p><i>Question:</i> “What was your average grade when you finished this study?”</p> | <p><i>Question:</i> “How do you rate your own level of analytical thinking?”</p> | <p><i>Task:</i> “Indicate the central phase of a daily course of instruction in schools”.</p> <p>Discipline-specific skills, e.g. in teacher education</p> | <p><i>Instruction:</i> “You talk with your supervisor, and try to get permission to participate further education of personal interest”</p> <p><i>Observation form:</i> “student respects his/her supervisor”</p> |
| Definition of competence | Standards | Curricular-based knowledge | Mostly existing | not (domain-specific) Cognitive skills | Performance in complex and |

| | | | | | |
|---------------------------------|----------|--------|----------|---------------------|---------------------|
| | | | | and/or knowledge | authentic situation |
| Indirect / direct assessment | Indirect | Direct | Indirect | Direct | Direct |

Source: Own illustration, partly adopted from Braun & Mishra 2016.

Self-reports are based on questionnaires in which respondents rate their competences or their activities themselves. Such questionnaires are called indirect measurements. Some scholars have questioned the validity of indirect measurements, especially in cases in which the survey neglects to clearly define the main construct, applying instead a more or less arbitrary set of terms. *Achievement tests*, by contrast, directly measure competences that are discipline-specific or cognitive (Braun & Mishra 2016). During such tests, individuals have to execute written tasks as it is mainly done as part of an international comparison, such as PISA tests (Meyer & Benavot 2013) or AHELO (Altbach 2015; Coates & Richardson 2012). Another direct way of assessing skills are simulation methods (Braun, Schwabe & Klein 2018). In contrast to “pure” achievement tests, individuals have to pretend to be in and to master an authentic situation. Instead of merely recalling prior knowledge, they have to perform and make complex decisions. These methods of assessing competences are called *performance-based tests* (MacCann et al. 2003; Shavelson, Baxter & Pine 1991). In addition to achievement tests, performance-based tests are appropriate for assessing the total of learning outcomes—going beyond the recall of knowledge and taking specific situational aspects into account.

Those complex and thus close to real life situations were also taken into account in so called situational judgement tests in psychology (Lievens & Sackett 2006, 2012), or so called vignettes-studies in sociology (Aguinis & Bradley 2014; Auspurg & Hinz 2015). Mostly, both approaches consist of presenting students with written, realistic scenarios and students are invited to pick an answer of multiple-choices within paper-pencil surveys. Beyond written surveys, however, both approaches can be realised in video-based applications (Lievens & Sackett 2006). And thus, measure flexible skills and performance more authentically.

Since the so-called “21st century skills” do explicitly cover general competences and behaviour like dealing with information and adequately communicating (Hyytinen, Toom & Shavelson 2019; Trilling & Fadel 2012), the assessment of performance becomes more important (Martin 2018). Among other things, that is why simulation methods have regarded increasing attention in learning and training in higher education. A recent meta-analysis concludes that complex skills like problem-solving and communication can effectively facilitated with simulations by using recent technologies (Chernikova et al. 2020).

A MULTIDISCIPLINARY PERSPECTIVE ON RESEARCH IN LEARNING OUTCOMES

This shift from certificates, measured by degrees and grades, to educational performance, measured by complex tests, has opened up new fields of empirical research in education. The growing field of research aims to answer a variety of questions, including: (i) valid and effective measurement of achievement and performance; (ii) determinants and inequality in competence acquisition over the course of an individual’s life through learning opportunities and; (iii) individual and collective consequences of skills for labour-market success and life chances in general. These three lines of inquiry represent research questions from different disciplines, which we compare in Table 3. Especially in Germany, research is more institutionalized and organised according to discipline not subject (Hüther & Krücken 2018). Although we are aware that within different disciplines variation exists, we do not take this into account when making our arguments on interdisciplinary research. What’s more, we confine our examination to the fields of psychology, sociology, and economics—a similar attempt to link these three disciplines

was made most recently by Wessling & van der Velden (2021) for flexibility in educational systems.

Psychological research undertaken over the course of the past decade, has profoundly shaped the understanding of assessing competences. Developments in advanced statistical methods and standards have also had an impact (Plake & Wise 2014; Slavin 2002; Quality Standards Working Group 2015). Higher education research has likewise led to the development of more sophisticated methodologies that have been applied in research on schools in particular. The definition of measured competences is fundamental to ensuring their validity. To this end, psychologists working in the area of assessment have helped establish a set value for defining the construct of competence.

The American Psychologist Association (AERA, APA & NCME) recently laid out new concepts of validity. Their argument-based approach (Messick 1995; Kane 2001, 2013) places attention on the “*nomological network*”: certain competence measures are better interpreted systematically, in combination with other constructs, that measure similar or different constructs. The result is one standard with which to explicitly formulate positive or negative correlations. The underlying idea is hold off on defining the meaning of each measured construct, until it is possible to construct the results of tests on individuals. The nomological network widens the scope of test construction to its determinants and contextual factors. For example, special learning environments in higher education should foster the level of competences in certain areas. The focus is thus shifted to the scope and limits of certain test instruments as well as to their empirically estimable consequences, both intentional and unintentional (Sinharay et al. 2014; Hattie 2015).

In general, the focus on unintended consequences of purposive social action has a long tradition in *sociological research* (Merton 1936). Research on the unintended side-effects of intentional behaviour has emerged as an important topic in the course of educational expansion and educational reforms (Hadjar & Becker 2009). More specifically, what are the short, mid and long-term consequences of educational expansion for inequality in educational attainment and later occupational attainment (Grusky 2008; Hadjar & Becker 2009).

One such line of research focuses on “*inequality of educational opportunity (IEO)*” (Breen & Jonsson 2005; Breen et al. 2010; Shavit, Arum & Gamoran 2007; Shavit & Blossfeld 1993). Several empirical studies have shown that educational success strongly depends on background variables like gender, social status, and migration background. In the majority of these (international comparative) studies, the outcome is measured by educational certificates as well as by grades. Since the implementation of large-scale assessments like PISA, PIRLS (IGLU) and TIMMS, achievement measures have also become the variable of interest (Schubert/Becker 2010). Evidence shows that there is also inequality according to ascribed characteristics—no matter which educational level is considered. These proven and relatively stable patterns of inequality continue to erode the ability of societies to function meritocratically, which means that non-performance-related influences continue to play an important role in educational attainment (Breen & Jonsson 2005; Allmendinger & von den Driesch 2014).

Education serves an important role in allocating individuals to fill positions in the labour market. Sociologists therefore also analyse whether there is inequality in educational returns within another line of research. Inequality in labour-market returns can be at least partly explained when additionally controlled for cognitive skills (Farkas et al. 1997). It is evident that there are significant differences in cognitive skills even within cohorts who possess the same level of formal education (Park & Kyei 2011). To explain this phenomenon, it is important to understand the role that contextual factors play in shaping learning and in realizing vocational success.

Economists, by contrast, have traditionally examined the labour market and how it functions. Already in the 1960s, Gary S. Becker applied the economic concept of capital to human resources by establishing the human capital theory (Becker 1964, 1993), which aims to explain individual

labour-market performance. The underlying assumption in economic educational research is that previous investments in education pay off in later vocational life (Psacharopoulos & Patrinos 2004). Human capital is embodied and defined as the sum of a person's knowledge, skills, health, and values that can be improved through education and training (Becker 1993: 15f.). According to this interpretation, one's labour-market success is the result of individual productivity—as formulated in the so-called mincer-equation (Mincer 1974). For a long time, indirect measures for individual productivity—like years of schooling (especially in the Anglo-American context) or educational certificates (especially in Germany)—and labour-market experience have functioned as proxies to model the relationship between education and income (Frazis 2002; Weiss 1995). In his signalling approach, Spence (1973, 1974, 1981), in particular, has claimed that educational certificates provide reliable information as they function as important market signals.

Nevertheless, since measures for competences and skills¹ have become available, researchers have come to see educational certificates as indirect indicators to measure individual productivity. Leading researchers in the field of economics have convincingly shown that basic skills in literacy and numeracy have positive effects for individual labour-market success in terms of income (Hanushek et al. 2015; McIntosh & Vignoles 2001). These findings have proven stable, without regard to time or country—even when taking the question of causality into account. Furthermore, these findings can explain differences in economic performance and development between countries, due to the fact that in comparing educational levels heterogeneity in skills disappears as a factor (Hanushek & Wößmann 2008). In other words, the individual level of competence does not correspond to the same level of education when comparing differently developed countries. Economists use reliable measures for competences on an aggregate level to compare.

Economic research analyses not only collective outcomes, but also the horizontal dimension on the individual level. Empirical findings based on tracer studies indicate that skills' acquisition is positively related with labour-market outcomes (Allen & van der Velden 2001). Even though these studies use self-reports as measuring higher education graduates skills, it is still possible to conclude that generic as well as discipline-specific competences are important determinants for labour-market success. As expansion continues within higher education, this positive correlation will increase still further. Moreover, recent empirical evidence on *mismatch* in graduate labour market shows that there exists variety between fields of study (Salas-Velasco 2021). And, these differences are probably due to the fact of general versus occupation-specific skills acquisition during studies. Although, this study is also based on self-reports and restricted to Spain, we expect similar patterns for other measures of skills and other countries.

Table 3: Different perspectives on performance- exemplary

| | Empirical educational research | | |
|-------------------------------|--|---|--|
| Involved disciplines | (i) Psychology | (ii) Sociology | (iii) Economics |
| “Traditional” focus | Test construction (according to „classical test theory“) | Inequality in educational opportunity (IEO) | Returns to (educational) investments |
| Term used in shifted paradigm | Achievement, performance | Competences, achievement | Skills, key competences |
| Key questions (examples) | Defining competences and performance Measurement concepts Determinants of competence acquisition | Individual returns to learning outcomes Inequality of opportunity heterogeneity in skills by level of education Determinants of competence acquisition | Societal returns to learning outcomes Inequality in returns to learning outcomes context influences on macro-level |
| Key findings (examples) | Microlevel: Clear-defined concepts for discipline-specific and general competences | Microlevel: Inequality in competence acquisition and returns to learning outcomes | Macrolevel: Competences for Economic growth and wealth Microlevel: |

¹ Important assessment programs, which provide measures for skills in terms of achievement in literacy, numeracy and problem-solving, are PISA (Programme for International Student Assessment) for pupils as well as IALS (International Adult Literacy Survey), ALL (Adult Literacy and Lifeskill Survey) and PIAAC (Programme for the International Assessment of Adult Competencies) for adults.

| | | | |
|---------------------------|---|--|---|
| | | | Competences for monetary returns to education |
| Key challenges (examples) | Ensuring measurement equivalence for subgroups limitations of measurement in terms of consequential validity | Determinants in competence attainment Potential to explain inequality | Ensuring causality of effects Accounting for context differences |

Source: Own illustration.

This brief comparison between three disciplines has shown that the shifted focus on performance is in keeping with the increased multidisciplinary within the field of empirical educational research (see Table 3 for a summary). Whereas a few years ago, research questions and methodologies were largely defined by discipline, today research transcends such traditional disciplinary borders. Scholars from different disciplines share an interest in examining individual performance over the course of an individual's life. By looking at the assessment of performance, the context of its acquisition, and its effects on different levels, scholars have been able to gain a more accurate picture of learning outcomes. Within the field of empirical educational research, they consider both different levels (Micro, Meso, Macro) and their interaction with each other. The role of learning environments and determinants of competence acquisition have grown in importance (Braun, Weiß & Seidel 2014). Furthermore, recent research has shown that learning outcomes are not stable over the course of an individual's life: they can be the variable of interest by itself (determinants) or the resource for realizing further outcomes (returns). This means that competence acquisition does not end with initial education and formal certificates.

DISCUSSION AND IMPLICATIONS FOR HIGHER EDUCATION RESEARCH AND POLICY

Looking for ways to deal with recent societal changes, in the past two decades policymakers have prioritised introducing educational reform on an international level. This refers to higher education and vocational education training likewise (see table 1). By providing them with evidence-based recommendations, researchers in the field of higher (as well as vocational and continuing) education contribute to finding solutions (Coates 2016; Slavin 2002). Such policy decisions need to be based on evidence and reliable results that can be generated under one integrative paradigm. As pointed out in the title of our paper, we call it “from certificates to performance”.

In this paper, we have attempted to describe the postulated paradigm shift previously introduced by other scholars. We have done so by contrasting two educational fields (higher and vocational) and different academic disciplines. Before considering the greater implications of our argument for higher education research and policy, we would like to briefly reflect on some of the limitations of our claims.

First, we are aware that our claims are largely specific to one country, since much of our evidence is based on the German context. Germany has a special history with respect to higher education and traditionally a strong vocational education and training system, in sum this has led to path dependencies that have shaped new developments (Hüther & Krücken 2018). Nonetheless, all countries participating in the Bologna and Copenhagen Processes are confronting many of the same issues related to addressing the need for ongoing knowledge acquisition and opportunities for learning in societies that entitle their selves as “knowledge societies”. And, the German case can be seen as an interesting case study in the light of recent international developments.

Second, we know that some of our arguments are somewhat preliminary and only roughly sketched, especially with respect to different disciplines. This includes our focus on three – psychology, sociology and economics – only. Our aim, however, is to pave the way for identifying a more general trend. Further research is needed to verify or reject our findings. Our observations can thus be interpreted as a starting point for a more systematic approach of analysis that goes beyond mere description and cursory evidence. Consequently, this includes

broadening our view to other disciplines like historical and educational research, philosophy as well as teaching and learning. All these have significant impact on higher education and current policy debates.

Third, we do not examine critical voices with respect to the emergence of the shifted paradigm. Although, there is a strong international debate on the negative consequences of making education as well as educational outcomes measurable in terms of strengthening an “audit society” (Power 1999) and implementing this competitive perspective to higher education and labour-market orientation into studies (Biesta 2010), we do not open this path for a normative-driven debate. We are aware of these debates but regard them as outside the scope of this paper.

As a forecast, recent attempts to explore possibilities of constructive collaboration between – more critical – educational theory and empirically oriented educational research by bridging these two contradictory positions, however, seem to be promising (Falkenstern et al. 2020). The key can be seen in defining educational attainment and competence acquisition throughout the life course as a social process that goes along with personality development. And, social interactions can be particularly activated through simulation studies. Simulations are not only effective to train and promote complex skills in higher education (Chernikova et al. 2020), but also in the field of vocational educational training. Due to the fact that, at least in Germany, the assessment and implementation of more generic aspects of competence are more advanced in vocational educational training compared to higher education (Baethge and Winther 2015; Winther, Seeber & Wuttke 2016), we argue for a stronger convergence and adaption of applied assessment measures (Braun, Schwabe & Klein 2018).

In conclusion, we would like to draw attention to the possible implications of our claims for higher education policy. In line with the arguments made above, what respective graduates are able to do appear to be more important than what any certificate expects them to do. A great deal of national, valid, and resource-effective measurements of knowledge in higher education (Zlatkin-Troitschanskaia, Shavelson & Kuhn 2015) already exists. There is, nonetheless, still a need for additional tools that can examine different aspects of learning outcomes, such as well-being and responsible citizenship (Mühleck & Oelker 2020). Moreover, to strengthen comparisons of language and test construction, beyond already existing networks and measurements that exist on a national scale, there is a need for comparability on an international one. In addition to being conducted in multiple countries, research therefore also needs to explore the feasibility of international measurements, assessing complex competencies directly and going beyond mere knowledge acquisition.

Furthermore, we expect studies that are comparable on an international level to include countries outside Europe and therefore the European Education Area, such as nations from Asia, Latin America, and Africa. As educational expansion is a global trend affecting these countries in particular, it grows to include these “less visible nations” in research should be strengthened (Zavale & Schneijderberg 2020). Such findings at a macro-level would provide meaningful data and case studies for policymakers worldwide.

Finally, exchange between fields of education research is a potentially fruitful endeavour, helping scholars and policymakers to get a fuller picture of reliable and valid assessment, a more accurate idea of complex individual and social influences on competences and skills, and to find ways to develop the labour market and society. Fortunately, most research groups are mostly interdisciplinary, and major steps have been taken of late to integrate insights from different disciplines and to develop complex research designs and methods, such as performance-based testing. Although a lot has been done already in this regard, more still needs to be done, including improving performance assessment and both refining and broadening the definition of learning outcomes and learning environments.

In sum, we argue that the next steps of higher education policy could be to establish a worldwide-initiative of research collaboration, which would drive a definition and measurement of learning

outcomes. One risk may be, and lessons learned by the AHELO project, that policymakers want to make decisions quickly and expect immediate results. But, especially international collaborative research needs time for coordination as the implementation of a European graduate survey shows most recently (Meng 2018, Mühleck et al. 2020). One solution avoiding misunderstandings between researchers and policymakers can be seen in detecting different frames of communication within public debates (Savaget & Acero 2018).

And last but not least, international research groups will also have to address and reflect seriously the possible unintended consequences of their proposed educational reforms (Krücken 2014; Merton 1936). These limitations notwithstanding, we nonetheless believe that the future of higher education research lies in the collaboration and development of innovative assessment of complex learning outcomes, involving a variety of disciplines and different nations throughout the world.

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*Both authors were involved in developing a performance-based test to directly assess students' communication skills within the research group “Performance-based Test of Students' Communication Skills” affiliated with the “International Centre for Higher Education Research” at the University of Kassel (INCHER-Kassel, 2015-2017). This research project was supported within the German research program “Modeling and Measuring Competencies in Higher Education – Validation and Methodological Innovations” (“KoKoHs”) by the German Federal Ministry of Education and Research (BMBF) under the grant reference 01PK14001.