Quality in academia: concepts, history and perspectives

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This article provides a review of concepts of quality and excellence in higher education. It sketches the perceptions and development of quality in the German higher education and science system since the beginning of the 20th century, and related changes in approaches to quality assurance and development. Special attention is given to the Bologna process and the *Excellence Initiative*. The article discusses challenges for research management and administration as well as institutional research as emerging functions and professional roles. It critiques the trend towards excessive and one-sided quantitative measurement of quality in higher education and science, and outlines perspectives for future research and policy development in the field. Three key fields of tension identified are: (1) uses and merits of quantitative versus qualitative measures of quality, (2) the academic conceptualisation of quality as excellence versus the political-economic conceptualisation as impact or relevance, and (3) an individualistic versus holistic approach to quality assessment. The article proposes understanding performance as value added rather than in absolute terms, accounting for diverse conditions and starting points.

Keywords: quality, excellence, higher education, research, Germany

1 Introduction

The definition and development of quality in academia is an encompassing challenge that concerns higher education institutions (HEIs), their leadership, and higher education and research policy comprehensively, far beyond the classical quality assurance of teaching and learning. The perennial question is how institutional and organisational arrangements, measures and procedures can be grouped around the core missions and processes of higher education, research, and transfer in ways that they promote rather than hinder the quality of what universities and other research organisations do.[1]

In this context, the design and maintenance of relationships between HEIs, between HEIs and external actors, and within the higher education and research system as a whole, are closely linked to quality development. Furthermore, concepts of quality in

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higher education and research that underpin political instruments for measurement and steering of the sector have a significant influence on the academic ecosystem.

This article reviews quality concepts and the surrounding discussion of quality assurance and quality development, reflecting on the interrelationships between the concepts of quality and excellence. It focuses on the German higher education and science system, an important provider of models for higher education and a major research producer embedded in global networks.

We start by examining how quality in higher education has developed in general (section 2) before moving to research quality (section 3). Having discussed various attempts to define and theorise dimensions of quality, we next provide a historical perspective on the development of research quality and quantity in Germany with special attention given to the changes in quality concepts and quality assurance brought about by the Bologna process and the *Excellence Initiative* (section 4.1). We also highlight the specific ensemble of organisational forms producing the greatest amounts of research in Germany (section 4.2), followed by a brief discussion of current issues regarding new key functions and professions in the context of developing the quality of research, namely research management and administration (RMA) and institutional research (section 4.3). The article ends with a critical discussion of current trends in measuring the quality of higher education and science before outlining the main tension fields on the issue and putting forward key avenues for future research and policy development (sections 5 and 6).

2 Conceptionalising quality in higher education

The idea(l) of quality is not new; neither is its close connection with excellence (see, however, Moore et al., 2017). The ancient Greeks used the term *aréte* to refer to virtue or excellence, synonymous with fulfilling a purpose or achieving one's potential. The Latin term *qualitas* means type, quality, and value. The word *excellence* originates from the later Latin word *excellere*, meaning to surpass or to do better than expected, introducing the idea of one-upmanship. This concept implies self-improvement, thereby performing better than others at various levels of motivation or ability. Translated into academia, the notion of excellence suggests that some researchers or their research groups will outperform others. They may surpass their own expectations or those of others (see Jong et al., 2021 for a review of the concept of excellence in research). Highlighting the close connection between quality and excellence, Schöne (1966) argues that the locus of quality can only be established within an intellectual field where selection occurs. Selection presupposes transparent criteria and selection by experienced and legitimately appointed judges. Quality is thus an inherently problematic concept, as selection can and will be based on differing criteria. Although quality

can be said to *exist*, it will always be context-dependent, as the quality of the processes and judges will be neither necessarily equally valid or reliable.

Attempting to define academic quality in a universally valid way is one of the oldest and most difficult key questions in higher education and science research. This also reflects broader social science debates about quality and its assessment (see Beckert & Musselin, 2013; Meier et al., 2016). According to Barnett (1992), quality in higher education is a notoriously contested notion (see also Schindler et al., 2015). There can be no uniform definition of quality in higher education (Kloke, 2014; see also Welpe et al., 2020). Indeed, its elusive nature has been addressed in a general sense: *"Quality… you know what it is, yet you don't know what it is"* (Pirsig, 1974, p.163). Expanding on Vroeijenstijn's (1992) comparison of quality to love, Müller-Böling (1997, p. 90) tells us in the context of the systematic introduction of quality assurance instruments in the run-up of the Bologna process: *"Quality in the field of higher education is similar to love: you cannot grasp it, but it is nonetheless present; you can experience it, but it isn't quantifiable; it is always transient, you have to constantly and permanently engage with it"*. Although the notion of what quality is and how it can be measured in the academic world has developed and moved over time, what quality per se is, thus remains *"notoriously elusive of prescription, and no easier to describe and discuss than deliver in practice"* (Gibson, 1986, p. 128). Pellert (2002, p. 24) also suggests the impossibility of managing quality in a linear manner, because it is a *"multi-dimensional construct*."

From the disciplines of philosophy, economics, marketing, and operations management, Garvin (1984) reviews five definitions of quality. The transcendent definition refers to "*innate excellence"* and is not clearly defined. The product-based definition is specific and measurable, depending on differences in the quantity of an ingredient or attribute. The user-based definition considers quality as dependent on individual needs, which is inherently subjective. The fourth definition emphasises the extent to which a product meets set standards. Finally, the value-based approach defines quality in monetary terms, equating it with value, which measures worth in terms of costs and prices, suggesting the best quality for the money available, but not necessarily the best overall. In line with Pellert's (2002) and Vught's (1997) understandings, Garvin argues that this results in *competing* views of quality.

The notion of *fitness for purpose* has taken root in academia, for example, in terms of the *appropriateness* of courses, of those selected to transmit knowledge and of those assessing it (Ball, 1985; Harris-Huemmert, 2008). *Added value*, a criterion for judging the quality of courses, programmes or organisations particularly prevalent in the United Kingdom's (UK) academic context, was first proposed by McClain et al. (1989). Harvey and Green (1993) expanded these ideas further by including *transformation* (in addition

to *exceptional, perfect,* and *value for money*). According to them, quality can only be achieved if the person experiencing it undergoes *enduring* change through the acquisition of knowledge and understanding.

Kemenade et al. (2008) use a categorisation originally proposed by Beck and Cowan (1996) to distinguish four value systems for quality and quality management: (1) process control, (2) continuous improvement, (3) commitment, and (4) breakthrough.

(1) *Process control "will not result in quality improvement, but in quality standardisation"* (Kemenade et al., 2008, p. 178). There is a danger in this for academia, however, because standardisation may stand in the way of creativity and the opportunity to try out something new. Indeed, much of the research process involves trial and error.

(2) In the notion of *continuous improvement*, the definition of quality *"is the extent to which the object exceeds the expectations of the customer"* (Kemenade et al., 2008, p. 179). A single department of a low-ranking HEI might be perceived as having a certain standard of quality if it exceeds student expectations by producing better results than the year before.

(3) In the third value system, *commitment*, *"quality is the extent to which the goals of all stakeholders are fulfilled, taking into account [the] here and now and the future"* (Kemenade et al., 2008, p. 180). This involves the continuous and reflective engagement of all stakeholders who are not content to let processes remain static. New stakeholders are integrated into the quality strategy and should adhere to its values.

(4) The fourth value system, *breakthrough*, pays tribute to an ever-changing environment and is defined as *"innovation"* (Kemenade et al., 2008, p. 180). This is the degree to which goals will be fulfilled in the future, and reflects Barnett's suggestion (1992, pp. 47–51) that the best possible approach to quality assurance is a combination of both relativist and developmental concepts. The relativist concept includes the idea of fitness for purpose as a test for performance using both quantitative and qualitative methods; the developmental concept can possibly be regarded as a bottom-up autonomous approach, where organisational members assume responsibility – or ownership – for the quality of what they do.

Harris-Huemmert (2008, p. 38) complements the above, stating that any effort to improve quality should pay attention to the following:

- *Action*: Quality is concerned with what people do, the extent to which they do it and whether or not this doing takes in all of the facets of what the doing involves. Accordingly, this requires careful definition.

- *Motives and values*: Quality involves the attitudes and values people have relating to what they do, the intrinsic *why* of what they are doing. A high degree of self-analysis and cooperation with others seems the way forward here to ensure that everyone operates from a shared base of understanding. Yet, this is often challenging, especially in diverse, multicultural and multilingual teams of differing status groups and career stages (see also Dusdal & J. J. W. Powell, 2021).
- *Management*: Quality is linked to the overarching strategy of the institution. Ideally, the management strategy is clearly defined and is understood by all.
- *Investment*: Quality depends on what people are prepared to invest in terms of training towards improving what they do, and maintaining this level once they have achieved it. Arguably, this process can never be concluded.

3 Conceptionalising research quality

In order to conceptualise research quality, Langfeldt et al. (2020, pp. 120–133) put forward a novel theoretical framework. They argue that three dimensions need to be distinguished from each other:

(1) Notions of quality that originate within the research field *("field-type")* or in research policy spaces, such as research funding and evaluation (*"space-type"*);

(2) Attributes associated with *good research*, including originality and novelty, plausibility and reliability, and value or usefulness as well as relevance and significance for society (see Gulbrandsen, 2000; Lamont, 2009; Aksnes et al., 2019). Often, these dimensions are not sufficiently clearly characterised, delineated or specified, while often differing between disciplines. Therefore, what shall count as good research must be openly discussed and explicitly noted at the outset – and valid and reliable measurement instruments found.

(3) The *organisational sites "where notions of research quality emerge, are contested and institutionalised: researchers themselves, knowledge communities, research organisations, funding agencies and national policy arenas"* (Langfeldt et al., 2020, p. 115).

Research quality must be assessed not only with regard to the organisational context, but also across organisations and with attention to omnipresent disciplinary differences. In most disciplines, research quality is defined by a combination of peer review and bibliometric data, including scientific relevance in the form of publications and citations, originality and innovation, and internationalisation of research (Heinze & Jappe, 2020). However, if there is no clear definition and unambiguous assessment of quality, it can only refer to its processes, its users, and the circumstances of the evaluation (Kemenade et al. 2008, p. 177). Lamont (2009) shows how disciplines have their own,

sometimes quite different understandings of academic quality and excellence, which may lead to different interpretations of complex contextual conditions and often incompatible objectives and evaluations.

Therefore, diverse perspectives of organisations, organisational forms, and disciplines need to be stated and considered when assessing quality (e. g. Fu et al., 2022). Disciplinary differences aside, there is broad consensus in the academic community on fundamental aspects of quality such as maintaining academic values and norms, which include using theory, being methodologically sound or working diligently and carefully as minima (e. g. Reimer et al., 2021).

In our contemporary era of collaboration, the importance of multiple types of cooperation has increased, facilitated by globalised networking of scientific communities, continuous information exchange and data generation and use, as well as multiple research funding instruments and programmes that support cooperation via the establishment of educational exchange, mobility, and research networks (W. W. Powell et al., 2005; Baker & J. J. W. Powell, 2024). Among the results of collaboration are mutual criticism and stimulation, joint use of data and equipment, and service cooperation (Laudel, 2002). Increasingly, guaranteeing research quality involves teamwork, also across spatial, cultural, and disciplinary boundaries.

4 Development of quality and quality concepts in German higher education and research

4.1 A historic overview

Germany began the 20th century at the top of the academic hierarchy in Europe and beyond, not only in terms of Nobel Prize winners (Urquiola, 2020), but, more importantly, as the provider of models of both the *research university* and the *research institute*, the former spreading globally (Baker & J. J. W. Powell, 2024). The qualities of German higher education, such as research-based teaching, were emulated elsewhere and the German language was, for many decades and particularly in some disciplines, the scientific *lingua franca*. The two world wars – and especially the Holocaust – besides all the unspeakable damage they wrought, significantly decimated Germany's academic status and quality, which therefore needed considerable rebuilding and consolidation.

In the public policy discourse as well as in public policy across sectors, the notion of excellence – as indeed anything related to the term *elite* – was avoided since the Second World War, as it smacked of former Nazi notions. In higher education, this *Zeitgeist* was mirrored in West-German democratisation processes and relatively equal comprehensive universities regarded as having the same standards, irrespective of

their past reputations, including even ancient universities with world-famous traditions such as Heidelberg or Göttingen (Kehm, 2015; Pritchard, 1990). This also reflects Germany's *"variety of academic capitalism"* (Hölscher, 2015, see also Allmendinger, 1989) based upon a high skills equilibrium and high standards. The 1950s witnessed the beginning of a higher education expansion – and an even greater expansion in the numbers of research institutes. This would return Germany to a top producer of high-quality science, measured in the gold standard of research articles in leading peer reviewed journals (Baker & J. J. W. Powell, 2024): The number of scientific publications grew strongly, driven by a massification of higher education that is still on-going today, the founding of many new research universities, and the start of *big science* in Germany.

After reunification, a new phase of scientific expansion and integration began, also triggered by Europeanisation – especially the Bologna Process – and the *Excellence Initiative* as well as further policies and programmes devoted to quality and its assurance. The 1990s can be regarded as the heyday of the development of evaluation instruments in Germany, in particular in the area of teaching and learning (Harris-Huemmert et al. 2014, p. 107). Already prior to the Bologna process, some disciplines underwent meta-evaluations, in which the quality of their teaching and research came under scrutiny (Harris-Huemmert, 2008). Additionally, virtually all East German academic institutions were thoroughly evaluated after the collapse of the German Democratic Republic (GDR), which led to the widespread introduction of relevant instruments and to the question of why this should be limited to the Eastern German *Bundesländer*.

The Bologna Process, with the first elements being implemented as of 1997 onwards in the run-up to the Bologna declaration, was then responsible for the mainstreaming of notable changes in terms of both the understanding of quality and the organisation of quality assurance. Traditionally in German higher education, the professor was regarded as the main unit, source, and guarantor of quality in higher education. At the same time, degree programmes were being regulated and nationally standardised by examination framework agreements *(Rahmenprüfungsordnungen (RPOs))*, developed and adjusted in lengthy national processes involving subject associations and federal and national administration. The structural shift to Bachelor and Master degree programmes changed that and replaced RPOs by first programme and later system accreditation. It called for collegiate exchange on course contents that was very different to the previously more individualistic offerings of professors or lecturers in conjunction with nationally standardised regulations (Witte, 2006, p. 157; 199–200). Contents needed to be placed into modular structures, where the European Credit Transfer System (ECTS) needed calculating and later confirmation by accreditation agencies. Many German professors viewed this as an infringement of their academic freedom and it took time before they accepted the new status quo (Brändle, 2016). While quality management officers were still rare in German universities in the early

2000s, today evaluation or quality management officers are formally working within most HEIs in Germany (see section 5).

The *Excellence Initiative* (2005/2006) finally put an end to the German avoidance of excellence terminology as well as to the ideal of equal quality across universities, as far as the research side is concerned. Particular research groups or departments or collaborating teams could submit competitive bids for research funding (Münch, 2007; Leibfried, 2010). Several cycles of this highly competitive initiative have since attempted to crown a few German equivalents to the US-American Ivy League universities or Oxbridge in the UK. It is notable, however, that the focus of the Excellence Initiative is essentially on quality of research in parts of a university only, whereas internationally, excellent universities have world-class research throughout the institution *and* excellent lecturing staff as well as excellent administrations (Hornbostel et al., 2008). Nevertheless, the German academic landscape has undoubtedly changed, moving away from the idea of comparably good and similar comprehensive universities to a considerably more differentiated field, with only a few HEIs officially given so-called excellence status. Furthermore, *programmification* at national and supranational levels (Zapp et al., 2018) and *projectification* across scientific fields (Besio, 2009; Torka, 2009) emphasise – or even require – different forms of research collaboration. Since the 1990s there has also been a massive expansion of academic co-authorships – both between organisations in Germany and internationally, especially in the natural and technical sciences and medicine, with the social sciences and humanities following suit (Mosbah-Natanson & Gingras, 2013; Helmich et al., 2018; Baker & J. J. W. Powell, 2024). Co-authorships are an indicator of research collaboration and exchange, with such output considered to be of higher quality due to internal peer review as well as broader readership and higher citation rates (on global higher education research networks, see Fu et al., 2022).

In contrast with market-driven Anglosphere countries (Marginson, 2011), higher education in Germany is still widely considered a public good largely funded by taxpayers, which provides a particular legitimating context for high degrees of accountability and control over public monies (Hölscher, 2015). While this observation mainly to the education side of higher education, it might be said about research, too.

4.2 Organisational forms producing research and academic collaboration

An essential feature of the German higher education and science system is that it has highly productive universities and other HEIs such as the universities of applied sciences (*Fachhochschulen* or *Hochschulen* für *angewandte Wissenschaften)*, as well as non-university research institutes (e. g. Fraunhofer, Helmholtz, Leibniz, Max Planck), companies, public authorities, and hospitals, among other organisational forms con-

tributing to research production (Dusdal, 2018). Yet, only a few studies make cooperation between different types of organisations within academia the explicit subject of investigation (Dusdal, Oberg & Powell, 2019). So far, mainly size effects and the spatial proximity of universities and research institutes have been analysed (Horta & Lacy, 2011). Universities and non-university research institutes are organisations with a special governance and organisational culture that rely on the services of autonomous, highly qualified experts in research, teaching and knowledge transfer to achieve their goals. A tension arises between individual and organisational goals, with limited steering options for the organisation (Hüther & Krücken, 2016). This is particularly evident in research collaborations that fundamentally rely on personal acquaintance, trust relationships and experience, and follow intrinsic or instrumental motives and characteristics of the individual actors (e.g. Shrum et al., 2001; Dusdal & J. J. W. Powell, 2021; Lauer, 2024). Simultaneously, the attributed quality of research output is significantly dependent on organisational resources and reputation, in turn dependent on how organisations manage their research activities.

4.3 Research management and administration

Research management and administration (RMA)[2] and institutional research, two newly emergent areas of employment in German academia, play an important role in ensuring that the conditions within the organisation for quality research, as measured in creativity and major discoveries, are met (Hollingsworth & Hollingsworth, 2011). A continuous key task for RMA and institutional researchers is to measure quality; however, this can be challenging, often with unintended or unanticipated consequences. Numerous areas of administration are needed to support many of the processes involved (Krempkow et al., 2019). Similar to the work of researchers, RMA, often performing tasks as institutional researchers, adhere to the notion of *Wissenschaftlichkeit*, e.g. working according to academic rigour and principles, with a view to providing evidence and support to those making strategic decisions. An important condition for effective management is for RMA and institutional researchers to be given opportunities to be creative and to some extent even playful (Harris-Huemmert, 2017, p. 11), which, however, stands opposed to the traditional hierarchies in German university administration. RMA, located in quite diverse areas of employment, including international offices and quality assurance, to name just two main ones (Harris-Huemmert, 2017, p. 11), thus need to be given sufficient professional development possibilities to support and enhance professionalism. However, structured professional

[2]The German term *Wissenschaftsmanagement*, which we are referring to here, is often used in a much broader sense, as it comprises positions and tasks related to teaching, research, third mission, strategic development and others (see Winkler et al., 2024).

support is still not widespread.[3] At the same time, today, even many higher education leaders at the top describe themselves as RMA (or at least as *Wissenschafts-managerinnen and -manager* in the German context), as their work needs the meta-perspective and they are expected to be creative, motivating, and strategic – and ideally, transformative leaders (Harris-Huemmert & Rathke, 2024, in press).

5 Measuring (research) quality: perspectives and possibilities

In higher education, the quality of everything is being measured, assessed, and controlled. Societies increasingly seem to accept the continuous and ubiquitous measurement of everything (Mau, 2017), which can even be described as being audit-mad (Power, 1997). However, this is a relatively new phenomenon as societies have for a long time managed to exist with far fewer mechanisms of comparison and control. The erosion of trust in expertise and in those working within higher education and research has led to significant public monies being spent on assessment (Norris, 1999).

Supranational governance challenges those in research and teaching to acknowledge international and regional standards and reinforces the trend towards continuous quality assurance and monitoring. By 2021, half of the world's countries, especially in North America and Europe, had implemented quality assurance in higher education, with a more comprehensive perspective resulting (Bardakci et al., 2023). Courses and programmes are routinely evaluated and academic papers peer-reviewed, which are integral processes of assuring quality within academia. With regard to academic publishing, there is a trend towards favouring English-language journals, while disfavouring those that seem to contribute less to visibility in a world of stratified higher education research networks (Fu et al., 2022). This trend is particularly pronounced in smaller higher education systems such as the Scandinavian countries and the Netherlands. Powered by increasingly available big data and computing power, rankings and citation indices emphasise the continuous application of comparative and competitive measures (Kwiek, 2021; Brankovic et al., 2023).

Thus, academics today need to respond to various control mechanisms, which may negatively impact or indeed inhibit the free unfolding of curiosity and intellectual creativity. Borden (2023) argues that accountability (which he relates to centralisation, conformity, and compliance) is in tension with innovation (which he associates with decentralisation, entrepreneurship, and *respectful* defiance). While restrictions to academic freedom and autonomy are regarded as anti-democratic (Becher & Trowler,

[3] There are training opportunities emerging, though, as the executive Master programmes offered by the German University of Administrative Sciences in Speyer, the University of Oldenburg and the University of Applied Sciences Osnabrück, as well as individual modules offered, for example, by the Centre for Higher Education (CHE), or the Centre for Science Management (ZWM).

2001; Hölscher & Schubert, 2022), and can be measured in themselves (Spannagel & Kinzelbach, 2023), examining quality in academia is an accepted norm and unavoidable practice.

When academics ensure and measure the quality of research, an important mechanism is to count on the peer review process following submission of an article to an academic journal or when seeking funding for a research project (e. g. Brunet & Müller, 2022; Barlösius et al., 2023). Academics seek scarce resources (e. g. space in highly reputed journals, funding, professorial positions) in a system that is built on a meritocratic self-conception (Reimer et al., 2021). Connected to quality as well as to resources is the notion of academic reputation. While it is relatively easy to measure quantities (e. g. number of articles, citations, and graduates, or the amount of third-party funding), it is by no means clear how they transform into or reflect quality or how to measure their impact overall. Whole journals are dedicated to this topic (e. g. *Research Evaluation, Quality in Higher Education, Qualität in der Wissenschaft* and *Scientometrics*).

Within the current debates about the future of research quality measurement, we have identified three main areas of tension. For each, we point out the challenges and outline possible ways forward:

(1) The first tension field is about whether quantitative measurements of academic merit are sufficient, or whether we need qualitative assessments as an alternative (e. g. Ferretti et al., 2018). During the last decades, different quantitative measures have been developed by bibliometricians, especially on publications and citations received, aggregated on the levels of individual researchers, organisations (as in university rankings) or even entire national science systems. The underlying argument is that quality research is published research, and that quality published research will be cited by others. However, critics show that there are many possible biases, including negative citations (criticising the author), the *Matthew effect* (articles that are already often cited receive additional citations), and citation cartels (groups of authors citing each other) (Merton, 1995; Münch, 2006).

    With large-scale bibliometric databases, namely Elsevier's Scopus or Clarivate Analytics' Web of Science (WoS), indexation of research output has become much more comprehensive and efficient (Hirsch, 2005). While these indexes combine the number of publications and their citations in different ways, there are virtually always problems such as age advantages (i. e. older researchers have more publications and more time to be cited) and multi-author publications (i. e. articles with many authors get more citations; how shall the share of one author to the overall contribution be assessed and which bibliometric counting methods are applied?). Academics who start research later in life are also disadvantaged. General problems

with the indices are that they normally account only for a specific set of publications (e. g. Mills, 2023).

Despite these problems, quantitative measures are used in many ways, for example in professorial selection processes, as such figures have a convincing power in themselves (Heintz, 2010). Also, quantitative data is increasingly available. Especially the providers of the key databases (Elsevier's Scopus, Clarivate Analytics' Web of Science), but also other large publishers, such as Microsoft's OpenAlex, have developed different business models around this data provision. Programmes such as SciVal offer bibliometric analyses enabling comparisons with competitors, and they claim they can identify research strengths and even provide advice on allegedly developing innovative research fields and whom to hire. New digital and especially AI-based solutions will add to this (Krüger & Petersohn, 2022).

As quantitative measures are used in resource allocations and selection processes, they have myriad consequences, many unanticipated or unintended, some beneficial, others negative. The risk is, for example, that researchers focus all efforts on measurable output, instead of alternatives, such as good teaching, academic self-governance and community service, that require more in-depth and subjective assessment. As publications become increasingly important for maximising reputation, the phenomenon of *slicing*, the splitting up of one article into two or three, the so-called *minimal publishable unit*, occurs. This increases quantity but is detrimental to quality. Here Campbell's (1979, p. 85) law applies: *"The more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor."*

Due to this, numerous initiatives argue in favour of a more reflective application or even a reduction in the use of quantitative measures. The most prominent are the *San Francisco Declaration on Research Assessment* (DORA, 2012), the Leiden Manifesto (Hicks et al., 2015) and the *Hong Kong Principles* (Moher et al., 2020). The most recent development in Europe is the *Coalition for Advancing Research Assessment* (CoARA), which proposes a common vision *"[…] that the assessment of research, researchers and research organisations recognises the diverse outputs, practices and activities that maximise the quality and impact of research"* (CoARA, 2022, p. 1). These initiatives do not propose to eliminate all quantitative measures, but rather demand responsible and reflexive use of them and an additional consideration of qualitative aspects in research assessment via comprehensive peer review (Koenig, 2023).

(2) A second area of tension in assessing research quality is between the academic conceptualisation of quality as excellence versus the political-economic conceptualisation as impact or relevance. Many researchers argue for sticking to disciplinary

definitions of quality, originating from academia itself. However, external stakeholders, as well as some researchers, advocate for the inclusion of additional criteria, with the impact dimension being the most prominent, accounting not only for outputs but also for outcomes. While the disciplinary perspective is commonly referred to as excellence (e. g. European Research Council (ERC), 2023), the impact-oriented perspective can be connected to relevance (Rohe, 2015; Hamann & Schubert, 2023). Relevance can be assessed qualitatively, as in the Impact Evaluations of the United Kingdom's *Research Excellence Framework* (REF),[4] or quantitatively, as attempted via *Altmetric*. Adding additional criteria is of interest to science policy and society in general, as it allows for the introduction of steering mechanisms. For example, contributions to equality, diversity, and inclusion (along the lines of gender, disability, and other characteristics) or to reaching the *Sustainable Development Goals* (SDGs) are also interpreted as dimensions of quality by many. The *United Nations' Higher Education Sustainability Initiative* (HESI) is, for example, trying to incorporate the latter into international rankings.

From political, economic, and social perspectives, emphasising the impact of research can be reasonable. However, this approach presents challenges: the impact of a specific research output is extremely difficult to measure, and there are often considerable and unknowable time lags between discovery, publication, and the realization of impact. Introducing such measures risks de-incentivising basic research, which serves as the foundation for much applied research.[5] Additionally, while value-based governance of higher education is certainly a contemporary trend (Jungbauer-Gans et al., 2023), the independence of research might be threatened by the imposition of political agendas.

Due to the above-mentioned problems, some initiatives argue for the elimination of quantitative measures altogether and for alternative selection procedures for research funding. Germany's Volkswagen Foundation uses a three-step procedure in some of its funding streams. After a basic check that research proposals tick essential boxes, the top projects which all reviewers support are immediately selected. If funds remain, other projects are selected randomly (Röbbecke & Simon, 2023). Another option are *jokers*, allowing every reviewer in the process to put one

[4] The REF engages in a comprehensive measurement of academic quality by requiring HEIs to submit their self-identified best outputs for academic peer review by field; measuring impact has become increasingly important in this evaluation system, albeit challenging to implement across organizations (Marques et al., 2017).

[5] An interesting example here is the debate on the Nobel Prizes in Physiology or Medicine 2023. While some expected that Uğur Şahin and Özlem Türeci, the founders of BioNTech, would win the prize for developing a mRNA-based vaccine for Covid-19, the winners were Katalin Karikó and Drew Weissman for their basic research decades ago, under difficult conditions, leading to identification of a crucial chemical tweak to messenger RNA that enabled the development of effective COVID-19 vaccines that have saved millions of lives.

project on the funding list against other votes. The debate on alternative selection procedures of research proposals continues (see, e.g. Roumbanis, 2023).

(3) A third tension field concerns the lens through which quality is assessed, which can be individualistic versus holistic. Even more broadly, the focus can range from a single research paper, proposal or project to individual researchers and the organisational level of a HEI or non-university research institute to whole national systems. In many instances, quality of the higher level is assessed by aggregating the quality of the (next) lower level, for example the quality of single researchers is measured by the quality of their published articles (often measured by the impact factor of the journals, e.g. Kwiek, 2021) or research proposals (measured by secured third-party funding). Another example would be national science systems ranked on the basis of their universities' performance in the Times Higher Education World Ranking or the Academic Ranking of World Universities (ARWU), also referred to as Shanghai Ranking. While this is relatively straightforward and goes well along with methodological individualism, as for example promoted in simple rational choice models, this procedure might miss additional quality effects at the specific levels and even misjudge the direction of causality. It might be that a university is well ranked with respect to research output because it is able to attract excellent international researchers, despite mediocre or even poor quality of its support infrastructure – or the other way round.

This effect is well understood in the realm of teaching, where there is a broad discussion on *added value* when comparing top-universities that are highly selective in their student-intake with other institutions (e.g. Brown et al., 2016) (see section 2). We propose to start a similar debate with regard to research. In conclusion, we argue in favour of an understanding of performance as added value in the field of research, similar to that in the field of education. This requires consideration of different individual and organisational conditions and starting points – such as funding and equipment characteristics – for research performance.

6 Conclusion

In this article, we have reviewed many of the changes in the academic world related to quality, diverse understandings of the concept, and how consensus on quality measurement could be reached. These issues cannot be separated from the policy frameworks and investments that shape higher education. Quality requires constant redefinition and renegotiation, linking those directly responsible for research, teaching, or administration with those responsible for higher education governance and strategy-making at higher levels. However, tensions persist, and we have identified three main areas of concern that have remained consistent throughout many of the changes and developments described and are likely to continue in the future: (1) uses and merits

of quantitative versus qualitative measures of quality, (2) the academic conceptualisation of quality as excellence versus the political-economic conceptualisation as impact or relevance, and (3) an individualistic versus holistic approach to quality assessment.

Academic quality remains a multidimensional concept that must be contextualized, as illustrated in the case of Germany. Different stakeholders have contrasting views, experiences, and demands, and quality can be assessed at various levels. All these factors need to be considered when attempting to measure it.

With the increasing possibilities provided by artificial intelligence and the ever-expanding availability of data, the need to assess research at different levels will likely lead to the development of improved and more specialised measures, and their increased use. There is growing awareness that applying solely quantitative measures of quality will be insufficient and misleading, both in interpretation and behavior, also due to significant disciplinary differences. Therefore, it is essential that these measures are used responsibly. Particularly when high stakes are involved, quantitative measures must be complemented with qualitative measures, holistic human judgment, and peer review to more reliably and validly examine and understand the dimensions of quality in all areas of higher education.

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