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PISA and its consequences: Shaping education policies through international comparisons

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Abstract

As the field of education has become a highly internationalised policy field in the last decade, international organisations such as the OECD play an ever more decisive role in the dissemination of knowledge, monitoring of outcomes, and research in education policy. Although the OECD lacks any binding governance instruments to put coercion on States or to provide material incentive, it has successively expanded its competences in this field. OECD advanced its status as an expert organisation in the field of education mainly by designing and conducting the international comparative PISA study. With PISA, the OECD was able to greatly influence national education systems. Basically, States were faced with external advice based on sound empirical data that challenged existing domestic policies, politics, and ideas. One prominent case for the impact of PISA is Germany. PISA was a decisive watershed in German education policy-making. Almost instantly after the PISA results were publicised in late 2001, a comprehensive education reform agenda was put forward in Germany. The experienced reform dynamic was highly surprising because the traditional German education system and politics were characterised by deep-rooted historical legacies, many involved stakeholders at different levels, and reform-hampering institutions. Hence, a backlog of grand education reforms have prevailed in Germany since the 1970s. The external pressure exerted by PISA completely changed that situation.

KEYWORDS

education policy, evidence-based policymaking, Germany, international large scale assessments, OECD, PISA

1 | INTRODUCTION

For knowledge-based economies competing with each other worldwide, the production of human capital is deemed to be an important economic growth factor and tool for adapting to external changes in a globalised world. This growing importance of education as a means of productivity implies a strong demand for effectiveness and accountability

within national education systems. Hence, standardised large scale international student assessments have become more frequent in the last decades and have raised considerable interest in politics, media and academia. As a tool for evaluation, international testing is not new, either in international politics or in the field of education. Thereby, the OECD's Programme for International Student Assessment (PISA) was neither the first international study to analyse the performance of education systems nor was the assessment of education a new policy tool for States. Many countries have a long tradition of national school assessment. However, since the 1970s, the number of countries participating in international student assessments has increased steadily in the developed world and in developing countries. Kamens and McNeely (2010) estimated that by the end of the first decade of the 21st century, over a third of the world's states would use standardised tests to assess the performances of secondary school systems. As a testament to this prediction, PISA covered nearly 90 per cent of the world economy in 2006 (OECD, 2007).

By using standardised tests as a means of measuring educational outcomes, assessments allow for the quantification and comparison of education systems across countries, regions, and even individual schools. The results, which are often presented as competitive rankings, give the impression of a hierarchy of 'winners and losers'. The assessments are also used as a central instrument for prescribing reforms of national education policies (Martens, Knodel, & Windzio, 2014; Bieber, Niemann, Martens, & Teltemann, 2015). Thus, there is a substantial change in the overall means of policy making in education associated with the rise of international assessment projects. Among international large-scale assessments, the OECD's PISA is certainly the most recognized and comprehensive effort to cross-nationally measure the performances of education systems.¹

As an international venture to measure the competencies of students and evaluate the performance of national education systems, PISA is not a stand-alone project. Rather, it is designed and monitored by the OECD as an actor with particular interests and policy positions regarding education. Since the mid-1990s, the OECD has emphasised the production of human capital to counteract the emerging effects of globalisation. This new policy orientation initiated a first turning point in the OECD's education activities: the shift from discursive contributions, to education policy, to the gathering of empirical comparative data (Martens, 2007; Henry, Lingard, Rizvi & Taylor, 2001). Education was defined as a driving force for growth and the OECD was committed to improving the quality, equity, efficiency and effectiveness of their member countries' education systems.

A significant and successful feature of PISA is the depiction of results in the form of country rankings, providing a simple and intuitive account of complex relationships. Moreover, since PISA has been conducted every three years since 2000, these rankings are also compared over time to demonstrate if and to what extent a country has improved or not. Thus, PISA is accessible and useful for both experts *and* a wider public audience. By identifying models of 'what works' and by periodical reviews and comparative datasets, PISA results force States to improve their policies towards the identified best practice models in order to be competitive in a globalised knowledge economy.

In this article, we trace the internationalisation of education standards and norms through PISA and discuss how such studies are capable of influencing national education systems. More particularly, we analyse the case of Germany, which has initiated significant changes in its education policies in response to PISA. We argue that national idiosyncrasies (e.g. politics, polity, traditions, and the media), however, play an important role in moderating the power of PISA. In sum, it is neither PISA nor the OECD alone that are able to generate impact on national education systems, but rather the combination of international impulses that are mediated by domestic actors and institutions which explain reform processes. Methodologically, our study is rooted in an historical-comparative analysis and makes use of document analysis and expert interviews.²

2 | THE GERMAN REACTION TO PISA IN A COMPARATIVE PERSPECTIVE

Compared to other countries, Germany has shown one of the strongest reactions to PISA. When the first PISA study was published in December 2001 it revealed – much to the surprise of most Germans – that, compared to its peer countries, the German education system was falling behind. It found itself on the lower end of the international education ranking (see Table 1). The assumed German superiority in education turned out to be an optimistic illusion of past

TABLE 1 German PISA Results

	Average Position Rank	Reading		Mathematics		Science	
		Score	Rank	Score	Rank	Score	Rank
2000	20 (20)	484 (-)	21 (21)	490 (-)	20 (20)	487 (-)	20 (20)
2003	16 (19)	491 (~)	18 (21)	503 (~)	16 (19)	502 (~)	15 (18)
2006	12 (17)	495 (~)	14 (18)	504 (~)	14 (20)	516 (+)	8 (13)
2009	12 (20)	497 (~)	16 (20)	513 (+)	10 (20)	520 (+)	9 (20)
2012	10 (16)	508 (+)	13 (19)	514 (+)	10 (16)	524 (+)	7 (12)
2015	10 (14)	509 (+)	9 (11)	506 (+)	11 (16)	509 (+)	10 (16)

Note. The 'Rank' column refers to the rank of Germany among participating OECD countries; in parentheses rank among all participating states. (-) = statistically significantly below OECD average; (~) = no statistically significant deviation from OECD average, (+) = statistically significantly above OECD average.

Source: OECD, own account.

appraisals. Unaware of Germany's status as an education laggard, the public and policy-makers were not alerted until the first PISA report was published. PISA indicated that, between the 1970s and the year 2000, the German education system lost pace regarding effectiveness and equity in modern society. Furthermore, PISA showed that the major education problem was not to produce highly-educated élites, but to ensure that pupils at the lower end of the PISA achievement scale reached optimum performance levels in their academic life. Hence, in the terminology of the OECD, Germany failed to create human capital and deprived a large share of students of their chances to attain the academic qualities they would need to obtain optimal rewards in their working life (OECD, 2007). The high variation of performance between students from different socio-economic backgrounds continued to be viewed as problematic throughout the discourse on education reforms. Although Germany continuously improved in the PISA ranking (see Table 1), even the latest PISA instalment of 2015 once again highlighted this persistent problem of socio-economic inequalities for education success (OECD, 2016).

The public recognition for PISA in Germany was exceptional and the infamous PISA shock basically overcame the persistent deadlock in educational reforms, driving the implementation of new and mandatory education reforms. An ideological dualism 'between the economic world view that informs work at the OECD and education as a public good embedded in the humanistic tradition' (Rubenson, 2008, p. 257) became apparent. While the German ideas on education were traditionally characterised by a holistic view (of individual self-development in addition with societal issues), since PISA, a more economic-nuanced view of education was put to the fore (Münc, 2009). Built on the foundation of the Enlightenment, the German idea of education was based on the ideal of '*Bildung*', which refers to 'an unfolding of personality through self-cultivation' (Lundahl & Waldow, 2009, p. 372) and 'humanistic character building rather than instrumental ideas of learning for economic life' (Wiborg, 2010, p. 542). Utilitarian education outcomes were subordinate to personal self-refinement (Nagel, Martens & Windzio, 2010). Whilst economic considerations always existed in the interpretation of the education purposes, the humanistic education ideal was a keystone in evaluating education policies and potential reform initiatives.

The OECD's concept of education was partially antipodal to the traditional German education policy system. In the view of the OECD, the advancements of education systems should first and foremost contribute to human capital formation and secondly to the progress of social citizenship (Robertson, 2005, p. 157). The development of human capital through educational means was seen as a precondition to succeed on the global market, develop advantageous market economies, and ease problems resulting from ongoing globalisation (Sellar & Lingard, 2014). The view of the OECD can also be identified in PISA. Grek argued that PISA in particular was not just a neutral 'testing regime', but 'operates under a clear and specific policy framework, which is to be adopted by the participant countries if they are to improve in the future PISA assessments and thus improve their standings in attracting economic and human capital investment' (Grek, 2009, p. 28).

The PISA study and the interpretations of the OECD led to an evaluation of education under a means-end perspective in Germany by focusing on outcomes. After PISA, education was increasingly depicted as a tool to boost the national economy and secure Germany's future competitiveness in the globalised world. PISA results were a mobilising force in Germany because they were put in direct analogy to economic developments, ongoing globalisation, and international competition. Germany, which was traumatised by its inferior results in the first PISA studies, introduced comprehensive reforms of its secondary education system. With some reservations concerning reforming the education system and policy-making processes, Germany's reforms strongly correlate with the policies promoted by the OECD's PISA (Niemann, 2010). Accordingly, German education policy converged with an internationally-promoted model. In general, the reform discourse addresses how well students are able to apply knowledge and skills to solve related problems in various situations. The mastered curriculum is no longer seen as crucial for academic success. Rather, the focus is on the competences acquired.

A new approach to education policy-making was mirrored in the German education reforms since 2001. The 'empirical turn' became synonymous with introductions of output-oriented governance methods. The traditional German focus on input-oriented education mainly relied on budget allocation according to teacher/pupil ratio, structured education plans, curricula, centrally-structured organisational frameworks, and the like. This approach was identified as a blind spot that prevented the implementation of appropriate reactions to problems. Germany's education policy-making was adjusted to base reforms on data, reflecting a policy approach of accountability. At least three specifications of output orientation reforms can be closely linked to PISA. Education standards were established and centrally-monitored, detailed top-down governance was reduced, school autonomy was strengthened, and empirical education research and empirical-based policy-making were expanded. Additionally, several concrete measures and programmes to counteract the identified deficits at the school level were launched. German policy-makers of the 16 *Länder*, which are the regional districts responsible for education matters, almost instantly agreed upon the introduction of an action plan to confront the most pressing problems identified in PISA. The plan addressed concrete measures to improve education performances. Several projects were launched to counteract education discrepancies. They included early advancements – especially of socio-economically disadvantaged pupils –, advancement of pupils' basic skills, better cooperation between pre-school institutions and elementary schools, measures for quality assurance, advanced training for teachers, and expansion of all-day schooling. In this context, already existing and less controversial educational reform concepts were linked to the issues brought up by PISA (Tillmann, Dederich, Kneuper, Kuhlmann, & Nessel, 2008). However, differences between the *Länder* occurred concerning the scope and depth in implementing the grand education reforms. Whilst some performed much better in PISA (e.g., Bavaria or Saxony) than others (e.g., North Rhine-Westphalia or Berlin), the reform pressure was unevenly distributed across Germany. Accordingly, the *Länder* at the bottom of the inner-German PISA ranking introduced more comprehensive reforms than those considered as top-performers (Tillmann et al., 2008).

Comparing the introduction of school autonomy in the *Länder* of Bavaria and North Rhine-Westphalia (NRW) illustrates that, whilst the intensity of reforms varied considerably across Germany, all reforms pointed in the same direction. NRW introduced far-reaching school autonomy and Bavaria was more reluctant to grant encompassing organisational freedom to its schools. As a major consequence of the orientation towards outputs, school autonomy was expanded in all 16 *Länder* (Rürup, 2007). Generally, school autonomy was underdeveloped in Germany when compared to other countries. Schools operated in an environment that was highly regulated and did not leave much space for individual decision-making, personnel recruitment, and resource management (Carey, 2008). By focusing on the outcomes of education, it became pivotal to enable the institutions to provide for high quality education on their own at the same time. In this regard, the autonomy of schools was identified as a crucial factor (Hanushek & Wößmann, 2008). Whilst NRW is one of the German *Länder* that has significantly expanded the autonomy of its schools, Bavaria was far more reluctant in granting its schools far-reaching autonomy (Aktionsrat Bildung, 2010). For instance, in 2002 NRW initiated the 'Autonomous Schools' (*Selbstständige Schule*) programme, enabling 237 schools to act autonomously regarding recruitment, resource management, organisation of classes, and accountability measures (Klein & Hüchtermann, 2003). In contrast, Bavaria linked school autonomy more restrictively to measures of quality assurance

and state control was emphasised. Schools were granted some autonomy in implementing the binding requirements issued by the state administration (Döbert & Hüfner, 2004). Hence, state authorities in Bavaria still ruled out the framework of education, but schools could flesh them out on their own while being monitored by the State.

Taking a look at the actual impact of PISA beyond Germany, we can identify a plethora of different reactions. Like Germany, Denmark was shocked by its PISA results, particularly since its Scandinavian neighbours performed much better in the first round. Substantial changes towards increased national assessment procedures and support for disadvantaged students, however, were only implemented after an in-depth international review (Egelund, 2008). Despite this debate starting after the year 2000 PISA results were published, real policy changes were only made after 2003. After the surprising results spurred a great public debate, many studies analysing these results were conducted, bringing policy recommendations to the fore around 2003 (Egelund, 2008, p. 250). Although Switzerland was placed in the upper tier of the PISA league table in all testing rounds, about 20 per cent of its students were placed in the two lowest competence levels in reading literacy. Consequently, the results enforced already existing attempts of innovation, which accelerated the famous 'Harmos' reform project that finally harmonised the 26 cantonal school systems. Swiss policy-makers adopted most of the PISA-based OECD recommendations for secondary education, such as social equity, school autonomy, and quality assurance, within only a few years (Bieber, 2016; Bieber et al., 2015). Concerning PISA's impact on Japan, Takayama (2008, 2010) shows that it greatly influenced Japan's education discourse and policy reforms. A perceived crisis in education policy erupted in the late 1990s in Japan, as publications showed great shortcomings in the education system. In this climate, the results of the PISA 2000 round fell on fertile ground (Takayama, 2008). The Japanese government used the PISA results as an external source of legitimacy for highly sensitive policies and reforms (Takayama, 2008, p. 401). Israel was also affected by PISA. Following the publication of the 2000 PISA results in 2003, the Ministry of Education used the momentum to create a task force on educational reforms. Feniger, Livneh and Yogev (2012) argued that the ministry had already been working on reforms before PISA produced the first international comparative rankings of the Israeli education system. The newly-formed committee stressed reforms that clearly carried the thumbprint of PISA recommendations in terms of 'managerialism and a globalistic approach', including the goal to improve the country's performance in international rankings (Feniger et al., 2012, p. 329). Opposite reactions appeared in the US, where a relatively low performance position in the league tables compared with other advanced economies did not necessarily lead to public or political responses (Martens & Niemann, 2013). Only with the 2009 study did PISA become central to education discourse, as the Chinese demonstrated extraordinarily good results. These were viewed essentially as a new Sputnik shock. Similarly, the Chinese lead in PISA was interpreted as an omen for China's overtaking the US in its economic output. In England, the picture is more diverse. The education system had already been substantially reformed in the 1980s and standardised testing programmes were already commonplace. England performed well in the first round of PISA in 2000, but dropped in later rounds. Although results did not improve significantly, reactions to PISA were moderate and the British government employed a 'pick-and-choose'-strategy to adopt OECD recommendations (Knodel & Walkenhorst, 2010).

Apart from case studies of single countries, systematic comparisons of policy changes in a larger number of countries are scarce. By looking at different aspects of accountability and assessment practices, Teltemann and Klieme (2016) showed that the use of standardized assessments increased throughout OECD countries between PISA 2000 and 2009. Likewise, the use of assessment for purposes of comparison between schools increased in many OECD countries. Other policies, such as school inspections and accountability in the form of tracked achievement data, show more mixed patterns of change between different rounds of PISA.

3 | EXPLAINING THE POWER OF PISA

Overall, the impact of PISA on Germany (and on other countries) is remarkable, since the comparative study has neither any binding obligation nor any formal governance capability to enforce policies on States or provide direct incentives to stimulate reforms. In contrast, with PISA the OECD makes use of 'soft governance' tools such as benchmarking or (indirect) recommendations. This is reflected in the fact that many countries refer to PISA results in

order to legitimate domestic reforms in education (Martens et al., 2014). These changes might not always follow the actual policy recommendations of the OECD, but even when they are only used as a reference, PISA results clearly influence national policies.

Why was PISA successful in triggering educational reform in Germany? In short, German policy makers were faced with identified deficiencies and at the same time were presented with measures to counteract these failures. By triggering the German PISA shock, the OECD opened a window of opportunity for education reforms in Germany and the international organisation was put in the position to exert further influence on German reform directions. German policy-makers (and other stakeholders in the education administration and civil society) were pressured to consider how the education system could be improved. According to the established knowledge derived from the PISA results, the OECD made references to peer countries and best practices which should be adopted in the German education system. The OECD framed how education should be organised and provided direction for reforms. Hence, patterns for the 'right' reforms were disseminated by the international organization. German policy actors were urged to re-evaluate former practices and ideas under new considerations of competencies, utilitarianism, and output-orientation.

The 'PISA-reforms' were successful (in the sense that they could be quickly implemented) because the OECD created awareness for the need for reforms, provided points of orientation for changes, and made alternative education policy paths less legitimate. Finally, the OECD disseminated its interpretation of education to Germany by making policy recommendations. On the whole, PISA provided a source for best practices and gave orientation to German education policy makers as to which peer countries should serve as possible role models. In mobilising public (and political) calls for improving the education system, PISA also broke the blockade between German education policy-makers. The urgent need for reforms enforced a consensus for improvements. Hence, the OECD 'empowered' certain national stakeholders by delivering sound arguments for their views, whilst others' positions were eclipsed. Hence, the OECD was indirectly able to change the power constellations in German education politics since the international organisation strengthened those actors whose preferences and beliefs were identical to its programme (Armingeon, 2004). Actors who held different positions in education that were not supported by the empirical evidence presented by PISA lost power in terms of argumentative leverage. For instance, the post-PISA reforms strongly affected the work of teachers. The teachers' unions not only evaluated the reforms as a chance to improve teachers' work conditions, but also as a threat to their vested interests (Nikolai, Briken, & Niemann, 2017). Controversy was provoked by the unions regarding the introduction of accountability through empirical tests. Teachers were now increasingly faced with evaluations and PISA-like testing. Schools and school districts were externally monitored through national and international comparative assessments, whilst internal evaluations (at the level of individual schools) were also expanded.

4 | CONCLUDING REMARKS

At first glance, PISA seems to be an assessment of learning, creating a data base which can be used for comparing the education performances of different countries. In doing so, the study has become an international reference point for the performance of national education systems and has been able to create demands for initiating education reforms. However, by defining what the education systems of modern States should produce (in terms of students' performance outcomes) the OECD established a benchmark test in education. By being ranked at the lower end (see Table 1), which was reflected in the country's weak PISA performances, Germany did not pass the benchmark test for modern education systems.

The impact of international comparative studies like PISA also depends on national conditions (Nagel et al., 2010). National education institutions and infrastructure play as much a role as characteristics of national politics and polities (e.g., consensus orientation or federalism). When education policy is organised at the level of federated States, such as Germany and Switzerland, international influences face the veto power of different regional actors. This may significantly slow down legislative processes, especially in reaction to international developments. Informal institutions, such as historically-based educational traditions and ideologies, can also influence the course of reforms. Furthermore, whilst PISA may have a significant impact on formal policies, the actual outcomes of PISA-related reforms at the level

of curriculum, school instruction, or grading still need more research. Policies often remain at a formal level without changing the operational programme in organisations or the outcome (Teltemann & Klieme, 2016).

However, PISA is not without its critics. In May 2014, academics and teachers from around the world wrote an open letter to Andreas Schleicher, the OECD's director of education and of PISA, demanding to 'slow down the testing juggernaut'. At present, thousands of experts have signed it, expressing their concerns about PISA as an all too influential tool in education policy. Among other things, the authors criticised PISA's contribution to the reliance on quantitative measures, short-term education improvements, and the narrowing-down of the complex topic of education. Furthermore, the OECD's economic view on schools and the lack of its democratic legitimisation were highlighted. Moreover, PISA's method of data collection and presentation is met with additional scepticism. Against these results, highly diverse education systems with different historical paths and traditions are compared. Yet, PISA does so with little regard to the qualitative differences between very heterogeneous and large education systems (e.g., the U.S.) with much more homogeneous education systems of single regions or even cities (e.g., Shanghai) (Meyer & Benavot, 2013). Moreover, reducing the comparison of performance to a simple ranking is further contested as an inappropriate method for evaluating such complex and diverse national education systems. Yet PISA has been very effective in terms of defining the way in which education is being assessed and perceived in modern societies. PISA exemplifies the extensive use of quantified data in decision-making as a widely observed development: Advanced electronic data analysis techniques, available and encompassing data, and facilitated global exchange of information lead to a steady growth of assessments that are used to make informed policy decisions. The appealing added value of assessments is that they give an easily accessible account of cause-effect relations. In this regard, it is often believed that the analysis of assessment data can reveal solutions to identified problems – in the sense of best practice examples (Martens, Niemann & Teltemann, 2016). PISA is certainly a prototype of this trend in education policy.

NOTES

¹ Other studies are, for instance, Trends in International Mathematics and Science Study (TIMSS) or the Progress in International Reading Literacy Study (PIRLS), which are conducted by the International Association for the Evaluation of Educational Achievement (IEA).

² Between 2008 and 2012 we conducted a total of 20 semi-structured expert interviews in Germany. We interviewed policy-makers and representatives of important stakeholders in the education sector. In order to gain an in-depth understanding of our cases we supplemented the interview findings with policy documents and statements made in newspaper articles.

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