

***Bildungskrise – PISA and the German Educational Crisis***

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### **Abstract**

After consistently bad results in every PISA test (Programme for International Student Assessment) and an accompanying prediction of lack of skills in its future workforce, Germany might be on track for losing out in international competition. Because of PISA's overwhelming marketing presence, its results are a major political influence. The OECD PISA committee's recommendations based on the results are challenging the fundamental structure of Germany's three-tiered educational system, aiming to eliminate its segregational effects on social classes. In order to analyze PISA's effects on German society from the angle of educational policy, this study compares the goals stated in its documentation with its effects on the public perception of Germany's future workforce. Three fields of research are considered: Education as a concept for furthering society as a whole, assessment logic, and the educational system as a functional module of the nation state. The study will show that PISA's test results are valid in indicating an urgent necessity to improve the teaching of basic skills, such as mathematics, reading, and writing. The interpretations of and recommendations based on these results, however, are reflecting a solely utilitarian view of educational systems as supplying human resources for industry.

**Keywords:** PISA; Germany; schools; educational policy; shift of values.

## Introduction

In 1997, the Organization for Economic Cooperation and Development (OECD), an intergovernmental organization of industrialized countries, devised PISA (Programme for International Student Assessment) as a testing program to measure how schools around the world prepared their pupils to act as contributing participants in a globalized economy. Its results are designed to predict a nation's economic success. They are presented as a side by side comparison with their competitors. The triennial surveys exclusively test 15-year-old pupils in all participating nations and economies; they cover the three basic skills of reading, science, and mathematics applied to problem-solving and cognition in everyday life.

The results of the first PISA test, published in December 2001, were a shock for Germany. In international comparison, Germany's pupils ranked at 21 out of 32. This indicated that schools didn't provide adequate proficiency in basic life skills and that Germany might soon fall behind in the global race for economic well-being. What made the situation even worse was the fact that Germany continued to score badly in all four subsequent PISA tests. German media revived the 1960s battle-cry of educational crisis or *Bildungskrise*.

This paper argues three major hypotheses. First, Germany's educational system is undergoing a shift of values by substituting the traditional concept of *Bildung* – an untranslatable word incorporating education, erudition, general learning, and self-formation – with training for employability and job qualification. PISA has contributed to this shift of values by focusing on the economic impact of schooling and by being the most publicly visible test program of its kind. Second, PISA's prominent role in the public debate about education is in large part due to its huge marketing machinery, rather than objectifiable contributions. Third, PISA is not actually measuring educational success, because it reduces education to its economically quantifiable output. This paper concludes that PISA does not take into account the social role of schools and their duty towards educating citizens capable of furthering their personal fulfillment and – by extension – society.

## What Makes PISA Successful?

### Background

Development of the PISA assessment was commissioned in 1997 by the Organization for Economic Co-operation and Development (OECD). It is a standardized assessment of 15-year-olds still in school and has been jointly developed by participating countries. Its goal is to provide decision makers with quantifiable data for improving the output of human capital from schools. Prior to commissioning the PISA studies, OECD published the basic framework it would be based upon:

OECD countries are undergoing economic changes with important implications for the ways in which human capital is acquired and used. Exploring these trends leads to an analysis of the information and decisionmaking systems that shape human capital acquisition and utilisation. In turn, this analysis of the methods and institutions of human capital measurement, accounting and valuation, leads to the conclusion that improvements to these systems are a key factor in helping a nation's firms to compete. (OECD, 1996, p. 7)

PISA was first administered in the year 2000 in 32 countries, all but four of them members of the OECD (OECD & UIS, 2003, p. 3). By 2012, that number had risen to 65 participating countries and economies, including all 34 OECD member countries, 28 non-OECD member countries, plus the three economic entities of Shanghai, Hong Kong, and Macau (OECD, 2015c). With over half a million 15-year-olds tested in 2012, PISA has become the largest international comparison of the output of educational systems. In the media, PISA results are usually presented as a ranking table from highest to lowest with national flags next to the names of the countries.

### **Assessment Logic**

Central to the PISA test design is the concept of literacy, which focuses on how well candidates are able to apply knowledge to challenges of modern life. PISA consists of three assessment areas, measuring literacy in the domains of reading, mathematics, and science.

Starting from the year 2000, a PISA assessment is conducted every three years, each year, in turn, emphasizing one of the three focus areas. Tests are mostly pencil and paper, lately interspersed with computerized modules. They are conducted in selected schools and last two hours for each student. Each PISA test cycle covers a total of about seven hours of test items, with different candidates taking different combinations of items. Test items are a mixture of closed multiple-choice and open questions requiring candidates to formulate their own responses. Most items are organized in groups based on a real-life setting, with each item designed to be progressively harder to answer. In addition to taking the test, candidates answer a background questionnaire, providing information about themselves, their study environment and their homes. School principals are given a 20-minute questionnaire about their schools.

The data collected during the main test is analyzed separately as well as in combination with the questionnaires on the pupils' social and educational background. Contextual indicators relate results to student and school characteristics, while trend indicators show how results change over time. The data provided by each test cycle is presented in several specialized volumes by the PISA consortium of OECD, treating issues of gender and economic equality (OECD, 2013a), student's motivation (OECD, 2013b), reasons for school success (OECD, 2013c) and others. These analyses<sup>1</sup> often form the knowledge base for policy changes.

### **PISA's Marketing Machine and the Public Debate**

PISA's brochures state very prominently that its results indicate a nation's future prosperity, while they are presented in a sports-like list for international comparison. The resulting media exposure puts enormous pressure on politicians to fix an educational system that so obviously seems to be broken.

PISA is not the first international assessment of its kind. Educational planning depends very much on comparative data in order to be able to learn from the experiences of others. Large-scale international comparisons are a relatively new trend made possible by the globalized cooperation and technical advancements in analyzing large amounts of data. Other large-scale

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<sup>1</sup> Or, since most decision makers do not have the time to read six large volumes of dense data results, their "executive summaries", a 30-plus page compressed version of the results, which is provided for each test cycle and available for download from the official OECD website at <http://www.oecd.org/pisa/pisaproducts> (visited on 201-01-05).

studies include PIRLS (Progress in International Reading Literacy Study), which runs on a 5-year cycle since 2001, and TIMSS (Trends in International Mathematics and Science Study), which is deployed every four years since 1995. While these two focus on single faculties, PISA claims to cover the whole of school education by evaluating reading, mathematics, and science literacy. Whether PISA actually owns up to this claim will be discussed in a later section, but it is a very powerful argument for marketing purposes that makes journalists and politicians pay attention to its results.

The ultimately new feature of PISA though, which distinguishes it from all other studies, is its easily understandable, sports-like ranking presentation. Although the PISA consortium publishes several thick volumes on the various findings of each assessment cycle, the compact ranking presentation with national flags next to a country's<sup>2</sup> score is what is the most easily picked up on. In combination with this strikingly understandable presentation of complex results, PISA's claim to measuring the success of participating country's educational systems and thereby predicting the future economic well-being of that country's citizens makes for excellent headlines. The above-mentioned volumes published on basic PISA results – six for 2012, together amounting to 2,444 pages of high-quality in-depth analyses – play a comparatively insignificant role in the marketing process. Each of those volumes could be acquired for around 35€, but they are accompanied by a host of readily downloadable brochures, summaries, data tables, blogs, webinars and highlights (cf. OECD, 2015b); these free materials make it easy to ignore the in-depth studies. All of PISA's marketing uses affirmative language, leaving no doubt of its importance for a country's future:

“What is important for citizens to know and be able to do?” That is the question that underlies the triennial survey of 15-year-old students around the world [...] (OECD, 2014, p. 24)

PISA is not only an accurate indicator of students' abilities to participate fully in society after compulsory school, but also a powerful tool that countries and economies can use to fine-tune their education policies. (OECD, 2014, p. 4)

Once quoted by the press, these claims put enormous pressure on politicians – especially if, as in the case of Germany, their country's PISA results do not match up with its self-image of a leading industrialized nation.

All PISA publications, including the complete volumes, use easily quotable language, which would normally be associated with commercial marketing material. Journalists can take their pick from short bits to more elaborate passages and mix those with all kinds of graphs and pictures – all readily available in high quality from OECD's official website. The media attention creates a feedback loop where the public attention increases the importance of the PISA studies themselves and urges more and more participants to snowball into the testing cycles.

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<sup>2</sup> Not all of PISA's participants are countries (cf. OECD, 2015c). The official nomenclature uses the term economies, but since the vast majority of these are sovereign countries represented in the result tables by their flags, this text uses the terms countries and nations, tacitly including participants such as Shanghai, which are not internationally considered sovereign, or a country.

## PISA's Role in Measuring Educational Success

Central to the whole concept of PISA is the claim to measure the success of a country's school system (OECD, 2013c, p. 31). Put simply, the reason for inaugurating such a tool is that schools teach knowledge and skills that prepare pupils for the workforce. The test is designed to measure whether pupils who are about to leave school can employ what they learned to read in order to participate in society, put mathematical knowledge to real world use, and do the same with science. PISA does a very good job of measuring the ability of pupils to apply knowledge acquired in school to real world problems and therefore can make a meaningful contribution to the data on which educational politics aiming to improve these results are based.

By claiming to measure and compare a school systems' success internationally, PISA reduces the role of schools to providing knowledge and skills in the three areas its tests cover. This makes sense from a purely economic perspective but ignores an important part of the educational mandate of schools, which is to convey personal, practical, and political formation in addition to facilitating the capacity for training. The goals set for pupils can be summarized<sup>3</sup> as "attitudes, skills, and knowledge" (KMBW & LEU, 2004, pp. 11–13).

In addition to stressing the value of the tested skills for the economy, PISA publications consistently include references to the future role of students as citizens: In the definition for each of the three test areas, reading literacy is described as "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (OECD, 2010, p. 39), mathematical literacy "measured 15-year-olds' capacity to reason mathematically and use mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena, and to make the well-founded judgements and decisions needed by constructive, engaged and reflective citizens" (OECD, 2014, p. 17), and scientific literacy includes "an individual's [...] willingness to engage with science-related issues, and with the ideas of science, as a reflective citizen" (OECD, 2007, pp. 34–35).

This paper argues that while reading, mathematics, and natural sciences are indeed essential tools for producing constructive, engaged, and reflective citizens, they can only be seen as an indirect part of the basis for achieving this kind of enlightened citizenship. This is to say that, without reading, it would be impossible to acquire a worldview nourished by literature, art, music, and ethics. In other words, PISA actually tests the foundations on which citizenship can be built, while suggesting measuring the whole building.

## PISA's Impact on the Public Debate

The fact that the crudest summary of PISA's results – in the form of international comparison tables – is readily available to the press and easily interpreted by the general public makes PISA and its concept of literacy central to the public debate on education. In 2001, when reports of Germany's pupils' abysmal scores reached the general public for the first time, the news came as a shock. The press had a feast, titling "The Bill for our Outdated Education System" (Lehmann, 2001, p. 2), "Abysmal Report Card for Obsolete School System" (SZ, 2001, p. 8) "Outcome Could Not Have Been Worse" (Schubert, 2001, p. 27), "Many Pupils in Germany

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<sup>3</sup> These citations follow the wording in the school law of the state of Baden-Württemberg, which summarizes the role of primary schools in an exemplary manner. The spirit of schooling having a greater goal than the facilitation of knowledge permeates the school laws of all 16 of Germany's *Länder*.

on Lowermost Level” (FAZ, 2001, p. 4), “A Disaster in Almost Every Respect” (TAZ, 2001, p. 14), and the like. Being in the last third of the overall ranking was a huge blow to the Germans’ self-esteem, so there were many protests against PISA’s methodology, resulting in the addition of the new category “Problem Solving” to the test round of 2003. Nevertheless, this addition had not the desired impact of improving Germany’s results, which stayed very low throughout all subsequent PISA studies. In Germany, PISA became synonymous with educational mismanagement, which was widely perceived to be the main cause of pupils’ ineptness in international competition.

### **PISA’s Political Pull**

PISA was commissioned by the OECD for assessing and internationally comparing school-acquired skills with regard to their use in job-related settings. The outcomes of each test cycle deliver a basic profile of knowledge and skills across 15-year-old pupils in all participating countries.<sup>4</sup> Decision makers use its results to decide budget allocations for the school system and to consider the policies of other contestants in order to find a method of tweaking their respective systems to accommodate their own agendas. Test results are meant to be interpreted as indicators of future economic competitiveness and welfare in a globalized economy, where a skilled, productive workforce is key to international economic success.

The results are persuasive by design, and the subsequent political pressure is very high, even without considering the public pressure from media reporting. One academic study famously states that if a country succeeds in raising its average PISA score by 25% (and keep it there), “GDP will be more than 3% higher than what would be expected without improvements in human capital” after 30 years, when those higher achieving pupils start playing more prominent roles in the labor market (Hanushek & Woessmann, 2010, p. 22). For Germany, that would mean an increase by over 8 trillion USD in addition to the GDP with “education as usual” (ibid.).

### **Germany’s Educational Shift of Values and PISA’s Role in It**

The traditional concept of *Bildung* in the sense of self-formation, as envisioned by Wilhelm von Humboldt (1767-1835), sees the role of schools in cultivating socially responsible citizens for a lifetime of learning. On the verge of the 19<sup>th</sup> century, after Prussia lost its struggle against Napoleon, the Prussian king Frederick William III (1770-1840) was forced to modernize most aspects of his government and administration, including the school system. These modernizations were in part connected to the movement of enlightenment, which was sweeping over all of Europe.

At the time, Humboldt was Prussian minister of education. He took advantage of his King’s quest to strengthen his domestic position to start creating a school system consisting of elementary school, secondary school (*Gymnasium*), and university. These schools would be open to everybody and were intended to lead to a society of enlightened citizens. The selling point of this plan was that during the Napoleonic wars Prussian soldiers lacked the spirit and

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<sup>4</sup> The underlying reasoning for choosing 15-year-olds still in school as test subjects is that they represent the outcome of 9 years of basic schooling, which corresponds to the duration of compulsory education in most OECD countries. These pupils are seen as being on the verge of finding their place in the job world, so the reasoning is that if they function well in a professional environment, they will contribute to the economical welfare of their families, their employers, and ultimately the economy they live in.

unifying national identity to resist French *citoyen* soldiers. If a change in the schooling system could be expected to bring about more patriotic thinking citizens, Germany might still be able to compete internationally while at the same time paying large sums in tribute payments to France. In 1809, in a report to the King, Humboldt wrote:

There is a certain kind of knowledge that has to be made general, and furthermore a certain form of formation of attitude and character, that cannot be missing in anybody. The requirement for being a good craftsman, merchant, soldier, or businessman is being, without regard to one's particular profession, a good, decent, and enlightened citizen according to one's social class. If school education provides all that is necessary for this purpose, he will later acquire the specific skill of his profession easily and always be free to change from one to the other, as it happens so often in life. (Humboldt, 1903, p. 206) [Author's translation]<sup>5</sup>

Humboldt promoted a schooling system, which would teach basic knowledge in order to be utilized later in acquiring job-specific skills (Humboldt, 1903, p. 207); on top of that, it would also emphasize ethical values. Based on what they had learned at school, graduates would not only be able to later pick up job-specific skills easily, but society as a whole would draw profit from the fact that all citizens have a similar ethical mindset. Regardless, Humboldt's ideas of universal school attendance were too far-reaching for the King of Prussia, who had half-heartedly implemented some reforms to gain stronger domestic footing against Napoleon. It was not until a century later, in 1919, that the unified Germany of the Weimar Republic made free-of-charge school attendance compulsory until the age of 18.

Today, most Germans think of the Humboldtian view on education as an idealized educational concept which starts with Humboldt's idea that schools should teach pupils to maximize their potentials in order to fully realize their humanity and take an active role in society. The implementation of this concept nowadays includes the teaching of practical skills such as modern languages and natural sciences, which Humboldt was fervently opposed to.<sup>6</sup>

Over time, with its fruition around the Weimar Republic (1918-1933), Germany developed today's school system, which selects pupils at an early age in order to place them into one of three different tiers. At the age of ten, after four years of primary school, pupils who show no ability or inclination to submit themselves to prolonged academic studies are placed into *Hauptschule* (secondary I). Those pupils who do well in practical subjects and show no inclination to pursue further studies at the university are placed into *Realschule* (secondary II). Pupils who show academic prowess and want to prepare themselves for the university are placed in *Gymnasium* (secondary III). Germany's tiered school system with its early segregation is accompanied by an elaborate vocational apparatus; it will be discussed in more detail in the next section.

Shortly after the end of World War II, western countries were wealthy again and international corporations began to emerge; global competition began to challenge western nation's school

<sup>5</sup> Es giebt schlechterdings gewisse Kenntnisse, die allgemein sein müssen, und noch mehr eine gewisse Bildung der Gesinnungen und des Charakters, die keinem fehlen darf. Jeder ist offenbar nur dann ein guter Handwerker, Kaufmann, Soldat und Geschäftsmann, wenn er an sich und ohne Hinsicht auf seinen besondern Beruf ein guter, anständiger, seinem Stande nach aufgeklärter Mensch und Bürger ist. Giebt ihm der Schulunterricht, was hiezu erforderlich ist, so erwirbt er die besondere Fähigkeit seines Berufs nachher sehr leicht und behält immer die Freiheit, wie im Leben so oft geschieht, von einem zum andern überzugehen.

<sup>6</sup> An often forgotten oddity about the Humboldtian model of higher education is that practical skills and job-specific training did emphatically not belong in his concept, where schools teach enough basic knowledge and skills that anything specific can be acquired easily when it's needed.



systems. Starting in the 1950s and reaching its first peak in the early 1960s, society began to demand that schools should teach job-applicable skills instead of what was perceived as dead knowledge. Germany's educational system underwent a gradual shift, where output substituted input in the design of school curricula. Formerly curricula were based on criteria concerning the contents pupils should be taught, hours allotted for certain subjects, and teacher qualification; in the hope that this input would naturally lead to the desired result of self-reliant citizens. With the shift towards an output-oriented school education, curriculum design experienced the 180-degree-revolution of crafting curricula to produce pupils with certain standardized skill-sets and knowledge that could be quantified in standardized tests. This revolution culminates in the reforms after PISA and is the key to the shift in values of the whole of Germany's educational system.

In 1964, the educator Georg Picht (1913-1982) declared an educational catastrophe (*Bildungskatastrophe*)<sup>7</sup> for the first time in German history. With a lot of media attention, he voiced concerns that had been building up for some time in German society: Germany's expenses for education were very low in international comparison, not enough pupils reached *Abitur*<sup>8</sup>, there was a huge performance gap between rural and urban school districts, and the three-tiered school system needed fundamental reforms. Picht's message got kidnapped by the media, which simplified it into reporting that schools were not delivering the skills and knowledge necessary for their pupils to be economically successful in later life, thus endangering Germany's future prosperity.

The fact that Germany's educational system is undergoing a shift of values by substituting *Bildung* with job qualification can be linked to the usurpation of Picht's warnings by media and politics. While Picht – himself being a music lover and an ardent enthusiast for Plato's philosophy – aimed for equity in education and better school funding, his message was distorted to the need of teaching practical skills for immediate use and thus marginalizing subjects that have no economic application. PISA can be seen in the tradition of this first wave of school criticism and has contributed to the shift of values by focusing on the economic impact of schooling and by marketing to be the most publicly visible test program of its kind. The nowadays ubiquitous term qualification constitutes a direct connection to the workplace; within PISA's publications, it is used synonymously with employability. Consequently, for the German public, PISA 2000 was a wake-up call comparable to Picht's, showing that Germany's next generation would not be able to compete in a globalized economy.

## Policy Reactions to PISA

PISA results, if taken as an accurate measurement of a limited resource, have enormous persuasive power. Official reactions of the "Standing Conference of the Ministers of Education and Cultural Affairs" (KMK)<sup>9</sup> were issued the same day as the PISA 2000 results, which had been illegally leaked before their official release date. In their statement, KMK demanded improvements in all major fields of schooling: Language competence should be raised, Kindergarten and primary school were to be interlocked, the lack of reading competence should

<sup>7</sup> The original series of newspaper articles from the protestant weekly *Christ und Welt* was published in book form as Picht, G. (1964): *Die deutsche Bildungskatastrophe: Analyse und Dokumentation*. Freiburg: Walter.

<sup>8</sup> *Abitur* is the matriculation examination that completes graduation from secondary III, the *Gymnasium*.

<sup>9</sup> As de-facto governing body, the Standing Conference unites the ministers and senators of the *Länder* responsible for education, higher education and research, as well as cultural affairs. It deals with "issues relating to educational policy at school and university level and research policy, as well as cultural policy of supraregional importance, with the aim of achieving joint opinion and decision-making and of representing joint concerns" (KMK, 2015).

be addressed as well as pupils' understanding of mathematical and scientific relations. KMK also stressed the importance of the advancement of educationally disadvantaged children, of common standards and evaluation across all *Länder*, of professionalism in teaching; they also put forward a tentative call for all-day schooling (KMK, 2001).

Although at this stage most of KMK's demands were lip service without practical backup, it was clear that PISA results were as unacceptable for educational decision makers as they were for the general public. One of the early consequences of PISA was the 2002 expansion of educational research; this turn towards using the empirical arsenal of educational research for political planning is similar to the "Realistische Wendung [turn towards realism]" of the 1960s as demanded by educators such as Roth (1962) and Brezinka (1989). After the PISA and TIMSS studies, a significant increase in financial resources allocated to education also followed (Raidt, 2010, p. 247). In 2004, a comprehensive quality offensive called *Bildungsplan 2004* swept all *Länder*, aiming to improve the four sectors of professional competence, social competence, methodological competence, and personal competence. Four years later the German federal government in coordination with the heads of government of the *Länder* proclaimed a "qualification initiative", being a comprehensive educational reform program from kindergarten through university (for details, see Raidt, 2010, p. 114).

It is important to note the vocabulary of 'competencies' and 'qualification' permeating all education-related publications as the new yardstick for defining educational goals. Judging from the increased usage of job-market related expressions such as quality, competence, and qualification, as well as the contents of these proposals, they clearly indicate the utilitarian shift of paradigm in the Germany's educational consciousness, which abandons the traditional values of *Bildung* in favor of utilizing schools as tools towards job qualification.

### **The Role of Schools in Society**

Traditionally, schools convey personal, practical, and political education by facilitating desirable attitudes, skills, and knowledge. This threefold role of schooling for society is reflected in most legislative frameworks around the world. Lately, German *Bildungspläne* (educational roadmaps set by education ministers of the *Länder* to be implemented in public school curricula), tend to contain the term *Ausbildungsfähigkeit* (the ability to receive job training; KMBW & LEU, 2004, p. 11) with the goal of producing graduates who can make economic contributions.

At this point, the KMK, responsible for German educational politics, does not differentiate anymore between *Bildung* and competencies. Their output-oriented standards describe "the subject-related competencies including underlying stocks of knowledge that pupils should have achieved up to a certain time in the course of their training" (KMK, 2005, p. 6), while simultaneously explicitly claiming that

The mission of school education goes far beyond the functional requirements of educational standards. It aims at personal development and orientation in the world arising from the encounter with the central objects of our culture. Pupils should be taught to be empowered citizens who can responsibly, self-critically and constructively shape their professional and personal lives and participate in political and social life. (KMK, 2005, p. 6) [Author's translation]

## Young People Seen as an Economic Resource

The modern need for investment in resources naturally leads to the concepts of human capital and human resources. Human capital theory regards human resources as capital, which is acquired using time and material costs, and indirectly brings increased benefits to the investor. In terms of profit, the benefits must at least compensate for the investments made in human capital. Seen from this angle, *Bildung* shifts its meaning towards fuel for the engine of economic development (Knecht, 1988, pp. 41–43).

The OECD, and with it PISA, sees education in its relation to the economy, focusing on the economic value of schooling, to then generally affirm “the productive utility of human knowledge” (OECD, 1996, p. 22). This view has been characterized by the UN as the “human capital approach” to education (Tomasevski, 2000, pp. 23–24). It stands in opposition to the approach of education seen as a human right, where “education should prepare learners for parenthood or political participation, enhance social cohesion and tolerance” (ibid: 23). Because of the traditional idea of education as the formation of the whole person, German politicians rarely use the term ‘human resources’; but the concept has long found its way into political decision making (Raidt, 2010, p. 212).

Accompanying the educational shift from *Bildung* towards qualification are re-interpretations of formerly positive connoted terms, such as equity in education and lifelong learning, in the parlance of PISA. Raidt (2010, p. 209) notes that PISA’s demand for equity in education seems to be more accurately described as the demand for efficient use of human resources. The German Protestant Church (EKG, 2003, p. 7) sees the new usage of the traditional concept of lifelong learning gaining new ambivalence by being interpreted as “lifelong adaption to constantly changing economic needs and goals”. It demands that “*Bildung* should be more than just knowledge and learning”, its goal should be the understanding of self and the world of human beings (ibid: 8).

In 2007/8, with a view to international competition and in order to shorten the time needed for finishing secondary education, many German *Länder* ordered their *Gymnasiums* to reduce schooling before *Abitur* from 13 to only 12 years.<sup>10</sup> This policy entailed the first wave of student strikes since the seventies. Demands of the students were varied, but in essence, they can be perceived as protesting the assigned role of students as human capital. A Stuttgart pamphlet calling for strike stated: “*Bildung* is being streamlined according to economic use. [...] We do not want to be turned into *Fachidiots* [one-track specialists] who are being prepped for the job market” (Schüleraktionskomitee Stuttgart 2008: 2, cited from Raidt, 2010, p. 218 [my translation]).

The main fault for PISA becoming the yardstick after which schooling is shaped seems not to lie with PISA’s own statements, but with its presentation by the media and public perception.

## Cum Grano Salis: PISA results for Germany

Although the title of each PISA cycle’s recurrent fourth volume, “What Makes Schools Successful”, implies recipes for changing school systems, results and data from the international PISA test have limited value for shaping a country’s educational policies. The

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<sup>10</sup> Throughout Germany, this policy is known as G8, because pupils would stay in *Gymnasium* for only 8 instead of 9 years.

industry might base certain location decisions on the comparison of 15-year-olds' answers to PISA's questions, and general statements concerning the strengths and weaknesses of country's youth in global comparison might point to areas where political action is required. Nevertheless, decisions concerning reforms to national educational systems have to be based on data that takes local conditions into account. In order to produce high-quality results and a data basis for specific problems, such an assessment must adapt factors like size of test subject group and participating schools; as well as goals, objectives, and questions of the assessment, to local circumstances.

### Three-Tiered Segregation in German Schools

In Germany, Kindergarten is generally available for all children between 2 and 6 years of age, after which school attendance is compulsory. At the age of 10, after four years of primary education in *Grundschule*, teachers suggest one of the three types of secondary school according to the pupils' performance and personality traits. Parents then decide - within certain constraints set by their progenies academic performance and maturity – into which type of secondary school they want to enroll their children. This system of early segregation is unique worldwide and often seen as problematic. Today, only Austria retains a similarly early segregation system, while Switzerland and Liechtenstein switched to segregation after grade six in response to their first PISA rating.

Secondary I (*Hauptschule*) ends after ninth grade. It is the least theoretically oriented of the secondary choices. Education combines traditional knowledge acquisition with practical training in manual skills (Holfelder & Bosse, 1990, p. 612). Graduates mostly choose to go into an apprenticeship, which is a highly regulated combination of schooling and job training called Dual Vocational Training (*Dualer Bildungsweg*). Secondary II (*Realschule*) “provides an extended general education, which is based on real-life situations [...] and creates the basis for vocational training programs [...]” (Holfelder & Bosse, 1990, p. 52). It ends after tenth grade, whereupon graduating pupils are attested maturity (*Mittlere Reife*). They can then further their studies at the *Gymnasium* or enter an apprenticeship, typically in a white-collar environment. Secondary III (*Gymnasium*) goes onto grade 12 or 13 and focuses on academic knowledge. After grade ten, pupils can decide whether to pursue a career similar to that of Secondary II or enter the upper grades (*Oberstufe*) which lead to the *Abitur*, a nationwide standardized graduation test serving as the qualification exam for entering university (for more details, see Holfelder & Bosse, 1990, p. 55). In some German *Länder*, there is also a fourth type of secondary school called the comprehensive school (*Gesamtschule*). It comprises all three types of *Hauptschule*, *Realschule*, and *Gymnasium* under the same roof. The syllabus offers courses proprietary of all three types of schools and pupils are encouraged to choose according to their inclination. Up to grade nine and ten, all common subjects are taught in mixed classes. After grade ten, *Gesamtschule* turns into *Gymnasium*.

Germany's three-tiered educational system was originally intended to separate pupils at an early age and prepare them for the life that best fits their individual abilities and inclinations. The system allows graduates from every tier of secondary schooling to be economically successful in their professional lives as well as in their personal aspirations. For example, a plumber, having finished three years of apprenticeship after nine years of compulsory schooling, has a good chance of passing the standardized *Geselle* test, which makes her employable at full salary in enterprises throughout Germany. She might then try the more challenging four-year second stage of apprenticeship to attain the *Meister* diploma – a status

enabling her to open her own business and be a voting member of her guild, thus influencing policy in the field of plumbing and beyond.

PISA's defining principle is testing 15-year-olds<sup>11</sup>, because they are considered to be “nearing the end of their compulsory time at school” (OECD, 2015a), and – by extension – on the verge of entering the job market. Although the wording has become more cautious than before, when PISA claimed to “measure how well young adults at age 15 [...] are prepared to meet the challenges of today's knowledge societies” (OECD & UIS, 2003, p. 12), the underlying suggestion that 15-year-olds are at the end of their education still stands and still contradicts German reality. Germany's tiered school system is inextricably paired with Dual Vocational Training (*Dualer Bildungsweg*). This puts 15- or 16-year-olds into vocational training after leaving secondary I and II (*Hauptschule* and *Realschule*)<sup>12</sup>. In most cases, vocational training takes the form of an apprenticeship in an approved enterprise. Apprenticeships generally last three years, consist of a combination of vocational school and hands-on training in said enterprise and conclude with a formal examination for a nationally recognized degree. This system ensures that under-18-year-olds do not actually work in full-time employment, but stay in enrolled in a form of schooling that has been tailored to prepare them for their jobs, while simultaneously continuing to teach ‘classic’ school subjects. “Even for the two-thirds of all pupils who leave full-time schooling in Germany at 15/16 to enter an apprenticeship [...] part-time attendance at mathematics courses remains obligatory at ages 16–18.” (Prais, 2003, p. 142)

### **PISA-E, the Policy Reaction to PISA**

Since Germany does not have a centralized body governing school education, and each of its 16 *Länder* have their own educational jurisdiction, it would be virtually impossible to advocate nationwide changes without collecting detailed data tailored to Germany's specific educational problems. Shortly after the first international PISA test, Germany launched PISA-E, testing a national ‘extended’ sample many times larger than that of the original international study. PISA-E is tailored to and analyses in detail external factors such as regionally different school systems, curricula, demographics, etc. Data obtained by the tests, which are deployed the day after each PISA test in the same 200 plus six times as many additional schools<sup>13</sup>, is used to locate and address differences in educational opportunities for the sexes, socially divergent target groups, children with migration background, regions in eastern versus western Germany, etc.

PISA-E uses “entirely different mathematical questions [...] to reflect better (a) the actual school curriculum in Germany and (b) the spread of attainments of German pupils. In contrast to a total of 31 questions in mathematics in the international inquiry, the German national extended inquiry had an additional 86 mathematical questions” (Prais, 2003, p. 141)

<sup>11</sup> The official definition of PISA's target population reads: “PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who are enrolled in school and have completed at least 6 years of formal schooling, regardless of the type of institution in which they are enrolled and of whether they are in full-time or part-time education, of whether they attend academic or vocational programmes, and of whether they attend public or private schools or foreign schools within the country.” (OECD, 2014, p. 22)

<sup>12</sup> Graduates of secondary III also do not immediately enter the job market; they decide to either enroll in university or take up studies in an advanced vocational training program.

<sup>13</sup> In 2000, in addition to the 219 schools, which participated in the international study, another 1,466 schools took the PISA-E test (Stanat et al., 2002, p. 4).

If we consider the stated goal of PISA – providing decision makers with a quantifiable base for making changes in the educational system – then it seems strange that the survey is not concerned with mastery of the school curriculum, instead of testing how successfully pupils might cope with ‘everyday life’ post-school situations (Prais, 2003, p. 142). Especially notable are the ‘real life’ situations which include items like calculating the arc length of the blades of a revolving door to exclude air-flow between inside and out (OECD, 2014, p. 131) and the age of lichen according to its diameter.<sup>14</sup> It is not obvious in what sense this kind of questions test everyday mathematical literacy.

## Conclusion

The PISA study was designed by the OECD – an international organization with the purpose to consolidate the economic well-being of its members. As such, PISA’s goal is to determine and compare the usability of future human capital for participating countries and propose changes to the educational systems in order to maximize profits for their economy. PISA results point to weaknesses in the abilities of the current set of human capital and compare its quality internationally.

PISA delivers very detailed and very valuable data for international comparison of the job-related skills of 15-year-olds. The alarmist reception of its results is largely due to oversimplified media coverage – which is facilitated by PISA’s own marketing machinery.

Results are indeed disturbing for Germany and should definitely not be ignored; measures must be taken to improve the ability of young people to put their skills to economic use; not only for the benefit of the economy they are part of, but also for their personal economic well-being. One of the most alarming outcomes of the study indicates that a large percentage of 15-year-olds in Germany cannot read. A possible explanation for this phenomenon might be that children with migration background constitute a large part of PISA’s test candidates and do not have an adequate command of the German language to follow the classes they visit. Schooling must include all pupils and training in the basic skills must be intensified for weaker students, so they too can move on to other subjects, find their personal fulfillment, and be a contributing part of society.

On the other hand, education – in the *Bildung* sense of the formation of intrinsically human values – is about much more than the preparation of human capital. Human civilization is defined by the development of arts and skills whose values are not readily measured in monetary units. The media and public response to PISA results consisted in blind acceptance of its reductionist message and consequently cutting down the pillars of society’s educational system towards a quantifiable, result-oriented supply of human resources to the economy.

The underlying assumption of PISA is that schools should produce students who are able to adapt their skills to the needs of the industrial labor market (Bennett, 2006, p. iii). Following the detailed plans of action PISA’s analysts suggest for Germany’s school system would help maintain a skilled workforce and doubtless contribute towards a healthier economy. It would

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<sup>14</sup> A sample PISA question, quoted after Prais (2003, pp. 142–143) is given as: “The approximate relation between the diameter ( $d$ , measured in mm) of a small plant (called a lichen) and its age ( $t$ , measured in years) is  $d = 7\sqrt{t-12}$ . Ann found a lichen of 35 mm diameter. *Question:* What is its approximate age?” Prais’ verdict: “[This question is] particularly ‘unreal’ (even ‘imaginary’, in the technical mathematical sense): what is here supposed to happen in the first 12 years of the life of a lichen?” (Prais, 2003, p. 155).

not, however, further humanity's path towards a civilized society. What makes PISA a major factor for the ongoing crisis in the German educational system is the misconception of it being a tool for measuring educational success. It tests basic education, not general education and "says something about the preconditions for *Bildung*, but little about [*Bildung*] itself. [...] The foundation should not be confused with the building" (Adam, 2004, p. 10). By emphasizing qualification, skills, and standards, we face the danger of neglecting a content-centered debate or a culturally and regionally specific educational canon. Linked to this is the risk of neglecting school subjects with no direct macroeconomic or individual benefit. These include all subjects that are not part of the basic education defined by PISA, such as philosophy, the arts, and music (cf. Raidt, 2010, p. 247).

The shift of values from *Bildung* to qualification is deplorable; Germany's three-tiered segregational school system might be a chance to first deal with a basic qualification and maybe move subjects not directly related to job qualification to the higher grades. In spirit, the German tiered school system is intended to provide each citizen with the opportunity to undergo schooling according to his or her individual abilities and tastes. Unfortunately, the theory does not hold up to modern reality – especially when mobility between the tiers of secondary and tertiary education is concerned; Students mostly stay in the school where they were put at the age of 10 and follow the path of least resistance for their choice of secondary education. Moreover, the social background seems to be far stronger in determining pupil's secondary school than their academic performance or personal inclination.

PISA's focus on the application of factual knowledge in the modern work environment challenges the traditional German understanding of *Bildung* as lifelong striving to achieve a uniquely human mindset. It evaluates schools as a delivery system of skilled workers for the industry. While PISA results are indeed alarming and political action needs to be taken to better prepare pupils for the job world, Germany should not forget that *Bildung* is more than mere qualification. Maybe there is still a chance to keep subjects such as ethics, arts, literature, and music in school curricula while simultaneously renovating the outdated system of tiered segregation, which may keep late developers from getting the education they deserve. Wernstedt and John-Ohnesorg (2008, p. 11) might be onto something when they theorize that German middle-class parents are willing to put up with a flawed educational system as long as *Gymnasium* and *Realschule* keep their children separated from the socially disadvantaged and from foreigners.

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