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**Editorial: The Recommendations of the Standing Scientific  
Commission of the KMK for Dealing with the Acute Shortage of  
Teachers. A Critique from the Perspective of Vocational Training**

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## **Editorial: The Recommendations of the Standing Scientific Commission of the KMK for Dealing with the Acute Shortage of Teachers. A Critique from the Perspective of Vocational Training**

**ABSTRACT:** Based on an acute shortage of teachers that is expected to continue to worsen, the Standing Scientific Commission (SWK) of the Conference of Ministers of Education and Cultural Affairs (KMK) has published a position paper in which a number of recommendations are presented in order to ensure nationwide security for teaching in Germany. These suggestions are largely counterproductive (not only) from the perspective of vocational training. This article provides a central analysis of the evidence on which the SWK bases its recommendations and how it justifies them. It is revealed that some recommendations are not scientifically backed at all and where evidence is provided, questions often arise as to their relevance and viability. Overall, it can be seen that the recommendations of the Standing Scientific Commission of the KMK for dealing with the acute shortage of teachers hardly illuminate the cause of the problem and do so only one-sidedly (related to the teaching staff) while mainly recommending measures without scientific foundation, which in their implementation have little potential for resources, but large have potential for conflict. This is contrasted with reflections on the study and work motivation of teachers and a look at education financing in order to show where the possible causes of the shortage of teachers lie, what that has to do with career orientation and perceptions and how one could possibly make progress here.

*Keywords:* SWK, KMK, teacher shortage, educational policy

## 1 Starting Point

Almost exactly 20 years ago, Wolfgang Jerschek (2002, p. 323) from the German Institute for Economic Research noted a short-term relaxation in the staffing situation at vocational schools in Germany. After the conditions for prematurely leaving school had deteriorated noticeably, the gloomy forecasts from the 1990s did not materialize as much as feared. In addition, 5,800 new vocational schoolteachers were hired throughout Germany in 1999, which roughly corresponded to the demand calculated by DIW Berlin up to 2005. However, Jerschek warned against sitting back and relaxing, with the clear indication that this should not hide the fact that there is still a need for action at vocational schools. As reasons he cited the student-teacher ratio, which had continued to deteriorate, and the clearly observable aging of the teaching staff in all federal states (*ibid.*). Ultimately, there were two rigid measures that led to this short-term relaxation: On the one hand, the civil service law restrictions on early retirement, on the other hand, the consistent use of special measures, lateral and cross-level entry into the teaching profession by technically qualified university graduates but increasing also by graduates of university courses (Tenberg 2015, p. 481f). Bachmann (1999, p. 147) revealed more than 20 years ago that only about 23% of teachers at vocational schools had taken the undergraduate university path. Just as many (23%) were teachers with a job-related, specialist university degree without educational science and 12% with a job-related, subject-specific university degree in school services. Twenty-eight percent were teachers with a high school diploma, with 17% acquiring this at universities and 11% at teacher training colleges; 14% had either a master's or a technician's degree (p. 89f.). This remarkable status quo was the (interim) result of an ongoing process in the vocational teaching profession, because a systemic shortage of teachers was already identified there in the 1970s (Frommberger & Lange 2018, p. 40). This process was (and is currently) something like this:

1. A state-specific needs calculation is carried out, which is mainly based on two trends: a) the foreseeable exits from the vocational school service and b) the estimated number of graduates in the vocational teaching positions.
2. This requirement calculation reveals a teacher shortage that is foreseeable in specific professional segments.
3. A special measure is generated and implemented at short notice, through which an attempt is made to bring "suitable people" into shortened training, often coupled with smaller teaching obligations and with various financial incentives.
4. The special measure is terminated
5. A new reckoning determines needs, special measures are generated and handled, etc.

In the meantime, there is hardly a location for vocational teacher training that does not implement lateral and cross-level entry in addition to basic training. For example, at the TU Darmstadt, the master's degree programs, especially in the subjects of metal, electrical engineering and information technology, are occupied by more FH engineers than by former bachelor's graduates from the TU. In the so-called cooperation models between teacher training colleges and technical universities of applied sciences, there are no longer any university-specific parts. It is therefore no longer possible to speak of THE basic teacher training in the professional field, because through this "emulsification" of the non-basic in the basic, various qualities have become so intertwined that they have to be perceived as a new reality from a rational point of view. There are countless variants here, always precisely tailored to local, regional and state-specific conditions. Concrete special measures were time-limited until about 10 years ago, meanwhile there are federal states in

which they are continued on an on-going basis (e.g. QuiS in Hessen, direct entry in Baden-Württemberg, ...), since there are so-called shortage occupations (metal, electrical, information technology, ...) which hardly succeeds in meeting the needs in the long term. A personnel recruitment tool that has always been criticized anyway (e.g. Tenberg 2015, p. 498f) because it could never replace basic teacher training, but which was thwarted, has proven to be exhausted for a long time. Helplessness has spread. Depending on the type and location of the school and the specific staffing situation, missed lessons at vocational schools are now normal. General subjects such as political education or sports are then sacrificed in order to secure professional training. Even if the regular classes are not cancelled, the continuing shortage of teachers will, on the one hand, preserve an ongoing tense situation in the schools and colleges, and on the other hand, many people will be busy acquiring and qualifying additional staff beyond basic teacher training. The quality of teaching is seen as a luxury that one can only afford to a limited extent, and related developments such as reducing class frequencies, expanding all-day offers, student orientation, inner differentiation, progress towards an inclusive school or increased support for children and young people in 'hotspot schools' are completely left out (Klemm 2022, p. 28).

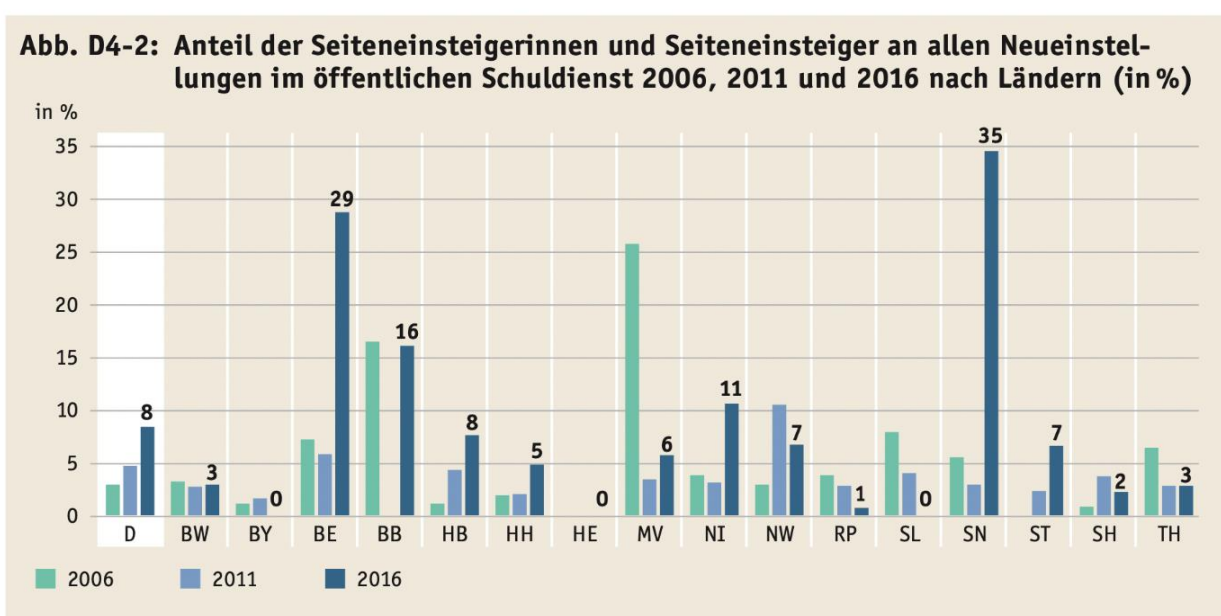


Figure 1: “Trends of lateral entrants by federal state in 2006, 2011, and 2016” (Sekretariat der KMK).

In the Education Report 2018 (authors' group education reporting 2018, p. 102) it was stated that the KMK had paid "increased attention" to "bottlenecks in necessary teacher recruitment". Over the past 10 years, the rate of lateral entrants has more than doubled throughout Germany (see Figure 1). "In addition to regular updating of the data, it was agreed that additional measures for career and study orientation, cross-border advertising campaigns and the exchange of state-specific concepts for recruiting teachers would be examined". With the indication that one would have to wait and see whether these measures alone would be sufficient to cover the necessary need for teachers, the group of authors indicated at the time that the KMK should have become more active here (ibid.). In the meantime, general education has caught up with vocational education, both in relation to the shortage of teachers and the associated helplessness. The Conference of Ministers of Education predicts

“that by 2025 there will be a shortage of around 25,000 teachers. By the year 2030, the negative balance between the need to hire teachers and the supply of new teachers will be around 31,000 (KMK 2022c). In an expert report on the development of teacher supply and demand, Klaus Klemm reveals that this prognosis is far too optimistic. The KMK numbers are fed from the forecasts of the federal states and are in part dubiously calculated (2022, p. 22ff). North Rhine-Westphalia is ignoring the current trend of declining student numbers in teaching positions and is simply updating the figures from the previous year to 2020 to 2030. Saxony's calculation is even simpler: the same value is entered on the supply side as on the demand side year after year. According to the Federal Statistical Office, however, the number of first-year students in teacher training courses is declining significantly. In 2021/2022, around 14% fewer students began a teacher training course in Germany than in the 2020/2021 academic year, which corresponds to the fourfold demographic and pandemic-related decline in first-year students of all courses (approx. -3.7%). Serious forecasts therefore assume that there will be a shortage of 40,000 teachers by 2025 or 85,000 by 2035 (Klemm 2022) or even 70,000 by 2025 or 156,000 by 2035. [...] Approximately half of the unmet need for teachers by 2025 will be in lower secondary teaching positions (13,610). However, the situation is also critical in elementary schools [...], in the upper secondary level in the vocational subjects or vocational schools (5,355, tendency unchanged) and in the special educational teaching positions (4,762, tendency decreasing).” (Standing Scientific Commission of the Kultusministerkonferenz [SWK] 2023, p. 6) (see also Klemm 2022, p. 25).

Related to this, the Conference of Ministers of Education (KMK) published a position paper a few weeks ago entitled “Recommendations for dealing with the acute shortage of teachers. Statement of the Standing Scientific Commission of the Conference of Ministers of Education” with approaches on how to counteract the current shortage of teachers. This statement, which was perceived ambivalently in the media and press, caused considerable irritation, especially among teachers. After all, it contains hints that imply that the teaching staff is to a not inconsiderable part of the cause of this misery and also offers recommendations that could make the school service significantly more difficult for teachers. In the TAGESSCHAU of January 27, 2023, the first reactions from the teachers' associations were noted: “The President of the German Teachers' Association, Heinz-Peter Meidinger, said that many of the suggestions were impractical and counterproductive. “Anyone who wants to limit or abolish part-time work and age reductions will drive even more teachers into early retirement and burnout”. “With these measures, the failure of politics is carried out on the backs of the teachers”, said Gerhard Brand, chairman of the Education and Training Association (<https://www.tagesschau.de/inland/gesellschaft/lehremangel-115.html>, 03/08/2023).

## **2 The Standing Scientific Commission (SWK) of the KMK**

The author of this confrontational paper is the Standing Scientific Commission (SWK) of the KMK, which was founded almost two years ago to support the KMK as an independent scientific advisory body. Seven top-class educational researchers from different disciplines are integrated here to advise the states with an interdisciplinary, longer-term and systemic perspective on the further development of the education system. So far, the SWK has published seven opinions, reports or position papers on topics such as pandemics, digitization and refugee problems in the education sector. In view of the fact that the experts involved here have to fulfill many other obligations as part of a full-time job, this seems very productive, because here it is important to obtain relevant, scientifically sound information, to discuss it thoroughly, to sort it, to bundle it, to focus it, analyze and finally transform it constructively in such a way that creative and innovative impulses are generated for the KMK.

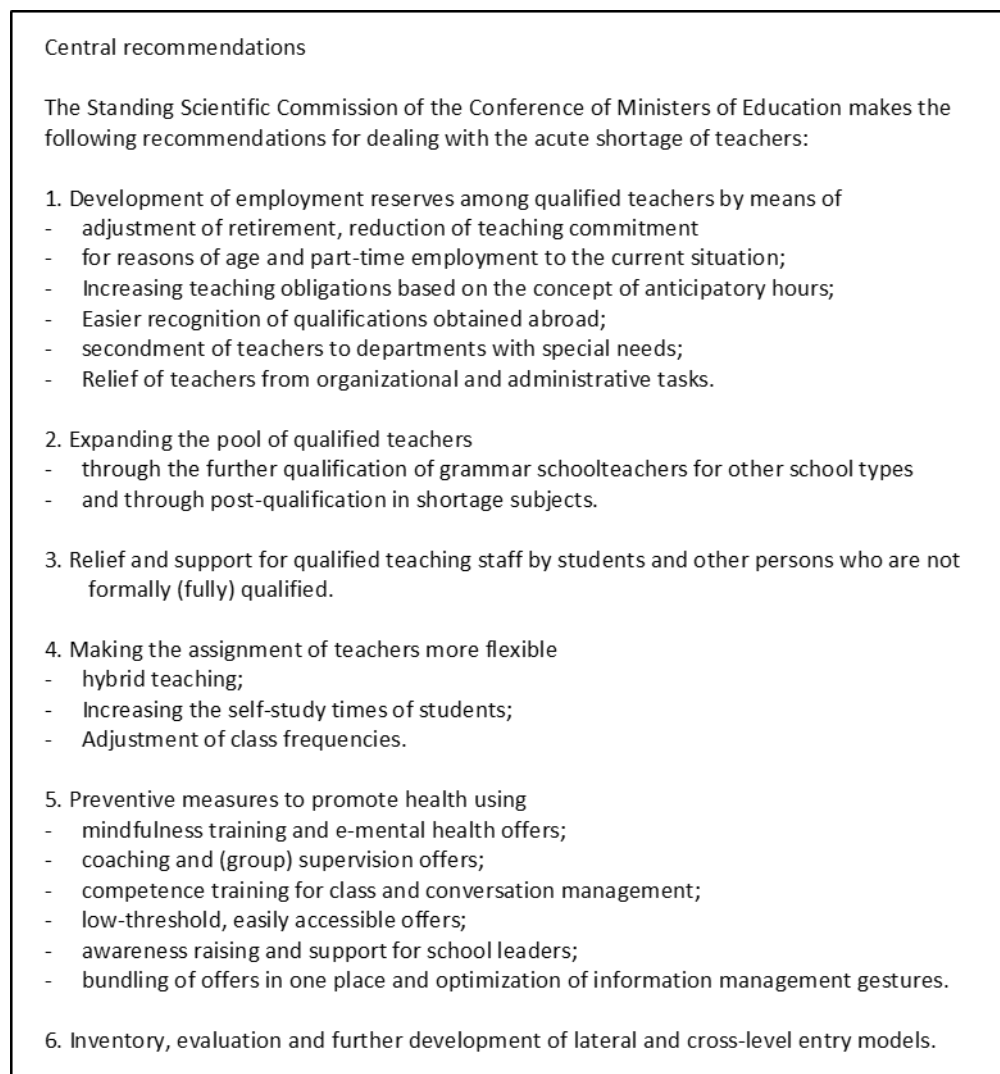


Figure 2: "Summary of recommendations" (SWK 2023, p. 4).

An average of four months elapse (from an outside perspective) between releases, which is very little time given the challenging issues that the SWK deals with and the high standards that must be assumed from its participants and suspension. So the question of the quality of these papers can definitely be raised, and in particular the question of their scientific basis. What is the science here? Is it the implementation of specific empirical studies in the individual topics? Impossible in just a few weeks. High-quality research of the international state of research in such a short time is not impossible but still very ambitious.

How the topics of the SWK are selected, which briefing the SWK receives from the KMK in this regard, to what extent the KMK participates in the work that then takes place, which other experts are involved and who selects them, how the decision-making processes work and which content and editorial paths are taken that lead to such statements cannot be determined from the outside. But anyone who is familiar with our administrative processes knows that very tough structures have to be in place here, and there would be far too little time for a conventional official channel. The fact that not too much should be expected here was shown, for example, by the report from September 2022 "Digitization in the education system: recommendations for action from daycare to university". The 14 recommendations summarized here claim to be valid for all areas of education and want to provide an impetus for teacher training proposals. In terms of examples

such as "Creating an infrastructure and making teaching and learning materials available" or the "Introduction of a (compulsory) subject informatics" means there is a lot of "room for improvement" regarding innovation and potential for impact. Nevertheless, even if the proposals are implemented this will not cause any damage, apart from the problem that the German education system will hardly catch up digitally in the OECD area. Unfortunately, this will not be the case in light of the current statement "on the recommendations for dealing with the acute shortage of teachers" (see Figure 2), because the alarming figures of the KMK make an enormous need for action clear. From the point of view of the teachers' associations, these recommendations could prove to be ineffective or even counterproductive, as many press reports indicate (e.g. in the *TAGESSCHAU* of January 27th, 2023). It is therefore necessary to clarify on the one hand what scientific substance is available here and on the other hand what forecasts of effectiveness can be based on it!

### **3 The recommendations for dealing with the acute shortage of teachers by the SWK**

The SWK statement begins with an introduction (SWK 2023, p. 6), in which the current teacher shortage, in particular its characteristics, causes and effects, is presented in a differentiated and well-founded manner, based on statistics from the KMK (see above). The shortage threatens the security of teaching and also impairs the quality of teaching (*ibid.*). Falling numbers of students are offset by rising numbers of teachers retiring. This would not be substantially counteracted with the measures taken by the federal states to date to recruit teachers. The Conference of Ministers of Education predicts that there will be a shortage of around 25,000 teachers by 2025, and 156,000 by 2035 (Geis-Thöne 2022), particularly for lower secondary level in general education schools, upper secondary level in vocational schools and special needs schools, while in some grammar schools there is still a surplus. Further differentiations are made in connection with the subjects taught, and differences between the federal states and within them as well as regional differences are also established.

Diverse and quite reliable evidence is used to show what consequences the lack of teachers has for the students and their development of skills. The performance of elementary school students has declined in recent years, risk groups have increased, and students from educationally disadvantaged areas of society and students with a migration background in particular are disadvantaged. This is followed by a discussion of potential ways of overcoming this problem over the coming years within the framework of basic teacher training and established special measures/lateral entry, which the tenor of the argument denies. This is primarily due to the demographic development, i.e. the decline in potential teaching students or career changers and lateral entrants as well as massive waves of retirement. Knowing full well that the following recommendations are hardly welcomed by the active teaching staff, a great deal of commitment over the past few years is attributed to them "in order to productively master various challenges in the interests of the students" (SWK 2023, p. 8) and concedes here the need for a time limit. This is enough empathy, although the teachers are not to blame for the current misery and, on the contrary, it is even confirmed to them that as they have been trying to fight it for years, they are now expected to take full responsibility for it. What the SWK proposes here in detail is then explained and justified in six central points (see Figure 2):



## 1. Development of employment reserves in qualified teachers

A number of measures are presented here, which are aimed at using the existing "resource of teachers" more consistently. The first two approaches 1.1. "Teachers who are or are about to be retired" and 1.2. "Reduction of teaching obligations for reasons of age" are then presented in a very structured and comprehensible manner, but without empirical evidence. Related to 1.3. "Part-time teachers" also follows a coherent but largely unevidenced line of reasoning. It is stated that family, health and organizational reasons are mainly relevant for the decision to work part-time, which seems trivial. As a result of the rejuvenation of the teaching workforce in some countries, a significant proportion would currently be in the family-starting phase. With reference to the Education Report 2022, it is found for the group of all employed women that around two thirds (70 percent) of women with at least one child under the age of 18 work part-time. Although no separate figures are available for the professional group of teachers, this explains the high part-time rates among female teachers without reliable evidence. This is followed by the statement that the largest employment reserve lies in limiting part-time work and the recommendation that part-time work (and Sabbath models) be significantly reduced (including accompanying measures). But there is also reliable empirical evidence here: Another reason given for the reduction in the number of hours taught by teachers is their workload in the classroom (evidence: Schaarschmidt & Fischer 2018, no page reference). In view of the findings presented here, however, it is difficult to understand the recommendations made by the SWK, because this would specifically mean that teachers would intervene in the regeneration space they had chosen to step back from while accepting salary restrictions. Again, there is no scientific basis for the recommended increase in teaching obligations based on the concept of advance hours, nor for facilitating the recognition of teachers with foreign qualifications. The study by Weizsäcker & Roser (2018) cited here is intended to prove that our rejection rate is too high. This cannot be checked directly, as this document again lacks the page number. As a result, the entire document can then be sifted through to finally confirm that only formal state regulations on the recognition of professional qualifications acquired abroad are presented there. There are no solid indications that these are not appropriate for the addressees. Therefore, these are rather speculative conclusions. Again, no scientific basis is established for the recommended secondment of teachers from a department with overcapacities to other schools with a need. Finally, it is proposed to relieve teachers of organizational and administrative tasks. The publication by Mußmann and Hardwig (2022), an empirical meta-analysis, is cited as evidence (without page reference). It is generally stated that teachers across Germany work far too much on average. It is added that so-called extra-curricular activities have increased over the last decades. These are specified with the creation of support plans, learning status surveys, digitization of lessons, implementation of hygiene plans, communication with parents, documentation requirements, ... (ibid. p. 1). In view of these findings, however, the relief from organizational and administrative tasks proposed by the SWK would at best lead to teachers returning from a consolidated overtime situation to a normal working situation. So, even if it were assumed that this measure could be done so easily, no significant resources could be generated. In fact, most of the tasks listed here can only be implemented by the teachers: After all, who else should talk to parents, digitize lessons or carry out learning status surveys? The evidence presented here must therefore lead to exactly the opposite conclusion, namely that the school system is already using teaching staff resources that go beyond the teaching load and therefore a general reduction in the teaching load should be considered, which in turn would further increase the current teacher shortage.

In relation to the first package of recommendations, it can thus be stated in summary that the arguments and conclusions presented here have hardly any empirical support. In addition, the only

incompletely cited evidence is hardly relevant, let alone sustainable and even partly justifies contrary conclusions. Such a development of employment reserves among qualified teachers has thus turned out to be largely speculative and is therefore to be seriously questioned.

## 2. Further qualification of grammar schoolteachers for other types of school as well as additional qualification in shortage subjects

In this section, the SWK focuses on teachers from overstaffed subjects and school types, but also student teachers as a resource for understaffed positions. In view of the figures and trends presented at the beginning, this seems hardly comprehensible anyway, because there are only a few understaffed teaching areas, and the trend is continuing to decrease. No scientific evidence is cited either for the "further qualification of grammar schoolteachers" (2.1.) proposed by the SWK or for the "post-qualification for shortage subjects" (2.2.). This is different for the "relief and support of qualified teachers by students and other, formally not (fully) qualified persons" (3.). However, the SWK first states here:

"There is little about the use and support of substitute teachers known. So, for example, it is not clear how many of the student teachers take on responsibility for their own lessons and to what extent, whether and how they are supported by experienced teachers or whether the people mediated by civil society actors receive a qualification that is related to the educational standards and takes into account the findings of teaching research" (SWK 2023, p. 18).

In a footnote, however, it is stated that a high-quality qualification is possible here, which the study by Abs et al. (2016), an evaluation of the Teach First Germany summer academy, should demonstrate. However, this is not a relevant study on student teachers, but a longitudinal study with n=56 aimed at lateral entrants on the effects of an "intensive short qualification" of three months on specially recruited people.

Thus – in summary – the arguments and conclusions listed in the second package of recommendations are perceived as having hardly any empirical support. In large parts, this deficiency is even explicitly pointed out here. The only piece of evidence presented here turns out to be irrelevant on closer inspection. The measures proposed for the further qualification of grammar school teachers for other school types as well as additional qualification in shortage subjects have proven to be largely speculative and should therefore be seriously questioned. They also harbor the risk of "cannibalization" between schools, school types or federal states, which would be foreseeable if appropriate incentives were implemented.

## 3. Relief and support for qualified teaching staff by students and other persons who are not formally (fully) qualified

This package of recommendations explains that student teachers or other people interested in the teaching profession could be used as another resource. A scientific underpinning of the SWK's arguments can be seen here. However, the diverse and mostly high-quality evidence cited here points in the opposite direction of the recommendation. It is explained that the use of students as teaching assistants not only interferes with the course and the associated professionalization process, but also that clear risks for the students' acquisition of skills are accepted (Bäuerlein et al. 2018; Scheidig & Holmeier 2022; Ulrich & Gröschner 2020; Hascher & Kittinger 2014). In addition, "the professional competence of teachers is an important predictor of learning success" (Blömeke et al. 2022; Hattie 2009; Hill et al. 2005; Kunter et al. 2013; Lucksnat et al. 2022) (SWK

2023, p. 19). In response to these findings, the SWK makes a clear restriction at this point: it does not recommend that students take on lessons, but rather their use to correct performance reviews (SWK 2023, p. 19). This not only atomizes the resource potential of this "measure", but also clearly shows how unrealistic the SWK is, because the implementation of this idea would foreseeably generate more effort than it would save (who should correct what, when, why, with which scale without knowledge of the lesson and the students???) and would also have enormous potential for conflict, because the grades are not trivial for students and parents. In the further course of this section, the impression arises that the restriction made here has been forgotten, because the recommendations that clearly contradict this follow: On the one hand, these are the use of teacher training students in the master's degree or main study with a maximum of ten teaching hours per week, on the other hand, a reliable assignment of the teaching student to an "experienced teacher and - wherever possible - a joint planning of lessons, but at least with an agreement on the use of tasks, material and performance controls" (SWK 2023, p. 19). This and in particular the following recommendation to involve the universities etc. appear counterproductive, as they apparently generate more effort than relief.

In summary, it can also be said for the third package of recommendations that the proposed measures to relieve and support qualified teachers by students and other, formally not (fully) qualified persons are hardly empirically supported. Although relevant evidence is brought in, this hardly supports the SWK's proposals, but rather calls them into question. In addition, this approach also harbors the risk of cannibalization, because the more they work as assistant teachers, the less they can study and thus extend the time until they start working. This can also be referred to as a zero-sum calculation.

#### 4. Flexibility through hybrid teaching, increasing self-study times and adjusting class frequency

The basic idea here is to create resources through student-active forms of learning and working, supported or rather carried by digital infrastructures, or by enlarging the classes. At the beginning of this section, the SWK states that reliable research findings on what they call hybrid teaching are still lacking, but findings from research on blended learning suggest "that the effects on competence development should be rather positive" (Li & Wang 2022). So: The SWK assumes that a competence development that should be "rather positive". That means, in my opinion, it can be translated thus: "We have no evidence and are citing an opinion here". The study cited is a meta-analysis of a conceptually very open teaching model in which parts of the teaching do not take place in person. Which parts these are, what proportion they take, how this is prepared, supported and moderated is completely open. Using purely statistical methods, Li and Wang examined 84 studies published between 2000 and 2020 for effects and found that blended learning is better across the board than the teaching with which this concept was compared in each case. However, the assumption that these effects arise as a result of the basic design, namely the general outsourcing of lessons to virtual rooms, as envisaged by the hybrid concept of the SWK, seems very general, because then something like an ideal universal concept would have been found. The fact is, however, that the quality of teaching is not decided on a general level, rather it is about complex, emergent and interdependent systems of dynamic human interaction and communication. All models that are empirically supported in this regard, such as Helmke's offer-use model, make this very clear and reduce idealizations or generalizations of individual concept features to absurdity.

The SWK sees similar resource potential in the flipped classroom format (SWK 2023, p. 21), in which the teachers no longer give direct instructions but withdraw to a moderating role. The students develop their knowledge independently here, which is useful and fruitful in many respects, and the evidence is convincing (Güler et al. 2022; Låg & Sæle 2019; Wagner et al. 2021; Jeong et al. 2019, Radkowsch et al. 2020). However, the SWK then determines for itself that

“this is a very demanding learning setting that requires elaborate competencies of self-regulation of the learning process. [...] In particular, students with little previous knowledge and little self-regulation skills have difficulties in self-regulated learning. Studies from the time when schools were closed due to the pandemic also showed the difficulties of risk groups in learning independently at home if the learning process was not closely monitored by the teacher. [...] The use of individual or collaborative self-learning time therefore requires that the students are systematically introduced to these forms of work and develop the necessary self-regulatory skills under supervision. The self-regulation of one's own learning process can also be supported through the use of scripts and prompts (instructions). In addition, support for the students based on the learning requirements is required” (SWK 2023, p. 21).

In summary, it can be stated here that - in relation to the use of teachers - hardly any gain in resources is to be expected, because this type of teaching is complex in terms of preparation, maintenance and updating. While it is taking place, a teacher must still be present or accessible in the background, and as expected, it is difficult for some students and requires their explicit preparation and support. Aware of this fact, the SWK narrows it down considerably by recommending that only parts of the upper secondary level be replaced by “collaborative self-learning times” (SWK 2023, p. 23). However, this is only possible if it is ensured “that the students have the necessary self-regulation skills” (ibid.). Conversely, it becomes extremely general when reference is made to the “potential of computer-aided collaborative forms of work” (ibid.). The state institutes should “provide evidence-based, quality-checked, cognitively activating digital task formats and materials for the self-study periods” (ibid.), which in turn would generate an enormous production effort, with a low probability of a fit to individual lessons in everyday school life. Many decades of classroom research have shown that this is precisely what is neither useful nor desirable: a school that distributes ready-made materials. Ultimately, there is a didactically and methodically acceptable approach here, but - within the scope of what can be meaningfully implemented here - without any recognizable savings potential for teaching staff resources. The SWK's position of deforming self-regulated learning into a concept for saving teaching resources appears particularly problematic, because this is explicitly an approach to improving teaching (definitely not making it more efficient), which has hardly been achieved across the board in a resource-neutral manner over the past decades.

The suggestion of simply increasing the classes seems as simple as it is ingenious. If 1,000 students are no longer divided by 50 teachers (class size 20) but by 40 (class size 25), 10 remain. However, the SWK concedes that it makes a difference whether you teach 20 students or 25. The empirical evidence presented here deals with this problem, but no consistent argumentation is developed. Rather, it goes back and forth, as first of all it is stated that there is no clear causal connection between class frequencies and student performance, “if the reduction is not accompanied by further didactic-methodical measures (Anger & Plünnecke 2022; OECD 2016)” (SWK 2023, p. 24), then that individual studies indicate that certain students would benefit from smaller classes (Hagemeister 2018; Schanzenbach 2014) (ibid.). “It regularly turns out to be difficult in the studies to observe class size effects independently of other factors. For example, differences in performance cannot be attributed solely to class sizes if the composition of the classes already prevents comparability (Leuven & Oosterbeek 2018) and, for example, students with learning difficulties

are systematically taught in smaller classes" (ibid.). Bach and Sievert (2019) also point out "that in primary school classes with 20 students and more, the reduction in class frequency led to slightly better performance in German and mathematics and a slightly lower probability of having to repeat a class" (ibid.). The finding that teachers give the greatest priority to reducing class frequency (OECD 2019; Wößmann et al. 2016, p. 26), as they see this as a central stress factor, goes in precisely the opposite direction (Aktionsrat Bildung 2014) (ibid.). The fact that, following this argumentation, it is nevertheless further explained that it is to be continued anyway, can hardly be understood. The already questionable increase in the number of class students, potentially at the expense of the quality of teaching and supervision, especially of our weaker students, and at the expense of the health of the teachers, could not simply be achieved by a few increases and reorganizations. Rather, one would have to proceed with rigid measures such as merging classes and merging schools, i.e. with elaborate and complex measures that would have to be designed or adapted to countless individual situations in the foreseeable future.

In the fourth set of recommendations, some empirical evidence is presented. In the case of so-called hybrid teaching, however, these are not relevant, since they relate to very unspecific teaching, which is enriched with self-learning phases (blended learning). In the case of the flipped classroom format, the findings appear to be largely relevant, but only to support the high-quality teaching-learning setting, and not as proof of further quantitative resource potential. Empirical findings are presented related to a potential increase in class sizes, which show little if any convergence, suggesting that one should be careful with such measures, since they do not contribute to the quality of teaching and are paid for with the motivation and health of student teachers.

## 5. Preventive health promotion measures

The SWK approaches listed here are based primarily on a teacher resource that is obscured by levels of sick leave, reduction to part-time teaching or early retirement. If the resilience of the teachers is encouraged - according to the logic of the SWK - they are ill less often, work part-time less and probably do not retire so early. The SWK sees the consequences of professional stress and strain as a key reason why teachers reduce their working hours or retire early and cites an empirical study by Toropova et al. (2021). However, this study cannot prove this, because it is dedicated to the connections between teacher satisfaction, school-working conditions and teacher characteristics for eighth grade mathematics teachers in Sweden. It then goes on to cite a range of evidence confirming heavy workloads for teachers (Voss et al., Robert Bosch Stiftung 2022), resulting in physical and mental exhaustion (ibid.). As evident as this appears here, a connection with a reduction in working hours or early retirement is also not proven. Therefore, the following statements regarding the health promotion of teachers appear interesting but not expedient, because there is no evidence that the reduction/compensation of burdens could reduce part-time quotas or early retirement. A central reason for part-time work is - across all occupations - e.g. the care of children (which is explicitly pointed out in Section 1 in recourse to the authors' group on educational reporting 2022), another a better work-life balance, etc. Vice versa, the final recommendations for mindfulness training, coaching and (group) supervision offers, training in class management and interviewing, prevention services across the entire career as well as cooperation and support talks or mentoring against the background of an increased workload (more hours) under worse working conditions (larger classes) are perceived as cynical by active teachers.

In relation to the fifth package of recommendations, it can thus be stated in summary that the arguments and conclusions presented here have hardly any empirical support. The statements

made here regarding the health promotion of teachers turn out to be speculative, since there is no evidence for the assumption that this could lessen working time reductions or early retirement. Schools or school administrations that comply with these recommendations are also open to suspicion that they are not increasing health promotion for teaching staff out of concern for their well-being, but in order to be able to burden them more.

#### 6. Inventory, evaluation and further development of lateral and lateral entry models

In this section, the SWK appeals to the standard instrument of the ministries of education, which - as already explained at the beginning - has proven to be quantitatively insufficient over the past decades and must also be assessed very critically with regard to its quality defects and counteracting of basic teacher training. Referring to Driesner and Arndt (2020), it is stated that doubts are often raised as to “whether all programs meet the requirements of research-based qualification for professional teaching design that enables the systematic acquisition of diagnostic and learning support skills” (SWK 2023, p. 29). In view of the relevant findings, this appears to be a very moderate description of the quality of these compressed approaches to time-saving teacher training (Melzer et al. 2014, p. 133ff; Tenberg 2015, p. 482ff; Keller-Schneider et al. 2016, p. 52f). In order to “follow the present statement to discuss the question of lateral entry in detail and in a differentiated manner as part of an expert opinion on teacher training”, the SWK recommends a “systematic inventory of all lateral and lateral entry models with regard to organization, scope and content”. However, just taking stock of state-specific aid measures can hardly be enough to make scientifically sound progress here. Instead, empirical comparative studies would be required to prove which approaches could possibly be suitable to compensate for our basic teacher training. That would be exciting in any case, because you would then also have to include an external comparison, because if it were determined for individual post-qualification concepts that they were as good as or even better than the basic teacher training, this could also be because the quality is lower than expected. Be that as it may, the SWK is not proposing any concrete measures here (knowing well that special measures, lateral and lateral entries are flourishing everywhere anyway). Instead they indicate that an expert report on teacher training will soon be generated, which I am very excited about, because I see here a lot of development potential (Tenberg 2018, p. 334ff).

#### 4 Interim balance

In summary, from this analysis of the recommendations presented by the SWK for dealing with the acute shortage of teachers, it can be stated that these are largely expressed without empirical validation. On closer inspection, the few and incomplete empirical evidence prove to be rarely relevant, and in some cases they even contradict the conclusions drawn from them. In relation to the first package of recommendations, it can thus be stated in summary that the arguments and conclusions presented here have hardly any empirical support. The stated "employment reserves for qualified teachers" (SWK 2023, 9f) are just as little proven as the potential for further or requalification of teachers from one teaching position to another. As far as the use of students as teaching assistants is concerned, the recommendations contradict the SWK's own statements. From a didactic perspective, the use of self-regulated learning as a resource for teachers proves to be a gross misuse of qualitatively intended forms of teaching. The hope of achieving more efficiency here with digitization is scientifically untenable. For the profane approach of simply making the classes

larger, the findings tend to point to caution, as the scientific examination of the health of teachers appears as counterevidence based on the recommendations made here. As assumed at the beginning, the SWK recommendations do not provide any assurances for their design and implementation. On the contrary, they raise many questions and also the justified fear that some recommendations harbor enormous potential for problems or conflicts.

The measures presented by the SWK are therefore largely speculative (and therefore quite risky), and they also indicate a very operative and pragmatic orientation towards prompt implementation. This seems opportune in relation to the current misery, but harbors the problem that the causes of the misery are simply ignored and the problem is thus treated on the surface in order to allow it to continue to develop in depth. In addition, measures are proposed here with regard to weekly and lifetime working hours, the implementation of which would be significantly at the expense of our teachers, which appears problematic from several perspectives. After the largest "employment reserve" was identified in part-time work, the reaction of the federal states is most likely here. However, this appears to be problematic from an employment law perspective (1), from a fairness perspective (2) and in particular from an impact perspective (3):

(1) Employment law perspective: In German civil service law there are clear regulations for part-time work. It must normally be granted for family reasons, reasons of age or health reasons. Since it can be assumed that precisely these reasons apply to the majority of teachers currently working part-time, interventions with regard to existing part-time regulations would require costly changes to the law. Based on the principle of fairness, it would also be assumed that no other regulations would initially be legal for new teachers.

(2) Fairness perspective: Over the past few decades, the teaching profession has (also) established itself as a profession in which the compatibility of work and family can be guaranteed very well through the use of part-time work. So part-time is not a temporary attitude, but part of a clear life plan for people who take on social responsibility. It would not only be legally questionable, but also unfair from a moral perspective to intervene here because this would force professional situations that cause damage to the family. Since it is predominantly women who take on multiple roles in work and family, this would be doubly unfair from a gender perspective.

(3) Impact perspective: Forced full-time work for teachers could foreseeably bring quantitative relief for schools and lessons, but whether this would also generate quality is to be assessed skeptically. This measure is expected to reduce the job satisfaction of the teachers concerned, as well as their collegial commitment, school commitment, etc. Due to the doubled workload, performance reductions would also be inevitable elsewhere: This means that lesson preparation, equipment, follow-up, pedagogical commitment and grading would be pragmatized in the foreseeable future. Negative effects could also be seen with regard to the health of the teachers, because not everyone is physically and emotionally able to cope with the increased effort. However, the most counterproductive effect will subsequently occur outside of schools, where young adults make their life plans. As soon as it is clear that the teaching profession can no longer be practiced part-time in the future, the number of enrollments for the teaching degree courses will decrease significantly.

Rigid interventions in part-time teaching are therefore strongly discouraged. This is initially for legal reasons and reasons of fairness, but in particular in view of the foreseeable negative effects on job satisfaction, teaching, pedagogy, school commitment, work ethic and the career decisions of the following generation. But why doesn't the SWK propose approaches that rely on incentives instead of coercion and restrictions? In connection with point 2.1 "Further qualification of grammar schoolteachers" (SWK 2023, p. 16) such are specifically discussed. The following are

listed here as examples: “later employment prospects at high school; civil service career in higher service; Salary according to A13 at the non-Gymnasium type of school”. Although the relief capacity in this aspect can be assessed as low (our current surplus of grammar-school teachers is manageable, as is their foreseeable motivation to teach in other types of schools), it would be significantly greater in relation to part-time work. The teachers' associations have also signaled their willingness to negotiate here, e.g. by implementing lifetime work accounts, i.e. the possibility of saving overtime over several years and later using it in the form of sabbatical years or earlier retirement. However, this would only be a postponement, but not a sustainable increase in teaching capacity. If you look for the exact reasons why teachers work part-time, you will usually find two dominant aspects: on the one hand the family, on the other hand the workload (Čandová 2005, p. 28). In many cases, this will change in the course of life. Children grow up and at some point leave the family. Induction, peer support, getting used to it and personal growth reduce the stress effects of the job. Nevertheless, it is predictable that many will remain part-time, for reasons of habit, work-life balance, etc. Financial incentives (in the form of bonus payments, etc.) for re-entering full-time would be effective here.

## 5 Causes of the teacher shortage

What the SWK still owes us is a precise explanation of the cause of our teacher shortage. Simply answering this question with demographics seems very inadequate and can probably only explain a small part of the problem. What is certain is that year by year fewer and fewer people are beginning a teacher training course, which must be related to the teaching profession and also to teacher professionalization. According to the Federal Statistical Office, the number of graduate teachers fell from 33,500 to 28,900 between 2011 and 2021 – a difference of almost 14%. The fact that this is not a demographic effect is clearly shown by the decreasing proportion of teacher training students at our universities, which fell from around 10% to 8% during this period. This raises the question of the main causes.

For many years there has been speculation about which people take up the teaching profession and for what reasons and intentions. The accompanying discussions as well as polarizations were not and are not always characterized by factual arguments, polemics and stereotypes often being used in these contexts. In the background there is a distorted and socially increasingly ambivalent image of the teacher, somewhere between “Dr. Specht” and “Fack Ju Göhte”. On the other hand, there are empirical findings that mostly reveal that student teachers hardly differ cognitively from other groups of students. However, their scientific interests, career motives and the acquisition of above-average skills are significantly lower in such comparisons. On the other hand, their social interests, professional security and private compatibility goals are significantly higher (Neugebauer 2013, p. 20f). The question now arises whether this was proof about 10 years ago that the main motive for the teaching profession was / is above all the allowance as well as July and August? Could it be that the terms “professional security and private compatibility goals” ultimately only mean the desire for good money with little work? In fact, it can be assumed that these aspects play a role here. This was shown, for example, in the effects of introducing civil servant status for teachers in the new federal states. How strong this effect is, or how this pragmatism stands in relation to other motivators, cannot be determined to this day. However, one thing is certain – in view of the current figures – that either these aspects or others must have lost their impact, otherwise we would be able to record reasonably constant numbers in teacher training courses.



As far as the motives of prospective teachers are concerned, a number of high-quality national and international studies have been published in the past decade (e.g. Retlesdoorf et al. 2010; Weiß et al. 2011; Watt et al. 2012; Rothland 2013; Glutsch 2019; Scharfenberg 2020; etc.). The focus here is always on internal, external and pragmatic motives for choosing studies and careers. Various accents are set, often in connection with the choice of subjects or types of school, but also in relation to biographical, socio-demographic, gender-specific aspects. The multifaceted nature of the topic is already evident here, because not all teaching is the same just as not all students are the same. Cross-state studies such as that by Scharfenberg (2020) reveal that there are also clear differences in the school cultures of different countries. In his study, for example, it becomes clear that the motives of American respondents show the highest values in the intrinsic area, those of the German respondents in the extrinsic area and those of the Romanian respondents in the area of pragmatic motives (Scharfenberg 2020, p. 247ff). It can therefore be assumed that within every school culture there should be something like yardsticks that are subject-, school-type and biography-specific in relation to the respective motivational structure of their student teachers. A longitudinal study that intends to determine more precisely motivational developments or shifts in this reference group should be based on such benchmarks. Again and again, cluster analyzes are carried out in the relevant studies in the German educational area (Scharfenberg 2020; Glutsch 2019; Weiß et al. 2011), which - despite different cross-sections, instruments and categories - come to relatively similar findings. Three groups are usually identified as the main cluster, which can be roughly divided into idealists, realists and pragmatists:

Table 1: „Cluster analyzes of motivation types in the teaching profession“.

<b>Studie</b>	<b>Idealisten</b>	<b>Realisten</b>	<b>Pragmatiker</b>
Scharfenberg 2020	Intrinsic	Extrinsic	Pragmatic
Glutsch 2019	Learning goal orientation	Performance goal orientation	Work avoidance
Weiß et al. 2011	Affinity with the apprenticeship	Security of career choice	Low motivation

If a finding is replicated so frequently, it can still contain something like a "Matthew effect" (with replicated findings one can validate and make good external comparisons), but it can still be assumed that it is relatively stable. However, this would only be tenable for the subdivision into three main motivational directions (which is always also simplistic in clusters), but not for the percentage distributions determined for each of them. Depending on how the limit values between the categories and clusters were set here, there are more or less prototypical or intermediate profiles in the main groups, which is equivalent to a very fluctuating consistency of the clusters from study to study. But that is not so decisive here, rather it is the certainly stable basic motivational structure in this study and career choice, in which the majority of the students are divided roughly 50:50 into idealists and realists, but always accompanied by a smaller (but not small) group of pragmatists. Empirical studies to explore the causes of our decline in teacher training courses must focus here by dealing very thoroughly with the different motives of high school graduates in relation to teacher training and the teaching profession. Based on this, it is important to find out what increases motivation to study or work in individual cases and what tends to reduce it. If you know more about it, you can react accordingly both in teacher training and in the school environment, based on reliable findings.

The previous discussion related to the teaching profession and how it is perceived by potential student teachers prior to the decision to study. The research by (Bröder et al. 2022, p. 28) shows

that decisions related to professional perception are also made during the teacher training course. It lists the following reasons for student teachers switching to a specialist course:

- The teacher training course was only a bridging solution
- little pedagogical interest
- uncertainty regarding personal suitability for the teaching profession
- lack of appreciation for the teaching profession
- difficult working atmosphere and high workload in the schools
- attractive alternative professional perspectives

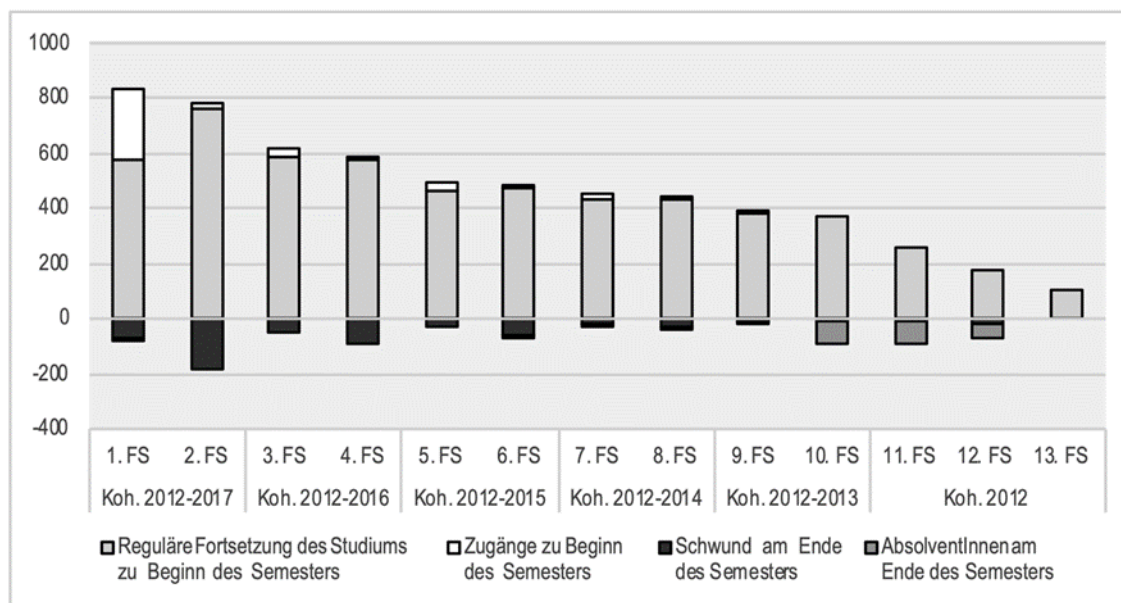


Figure 3: Shrinkage in the course of a high school teacher training course at the HU Berlin. This shows “cohorts that are shrinking strongly on average. [...] The majority of the decline occurs in the first semesters and especially after the summer semesters. A comparison of the 2012-2017 cohorts regarding whereabouts after two semesters shows that [...] the decline across the cohorts is declining slightly and more specialist cases or students remain in the cohorts. In the teaching profession at grammar schools, the cohorts have shrunk by about 30 percent after two semesters” (Güldner et al. 2020, p. 388).

Güldner et al. (2020, p. 385ff) point out in this context that the low dropout rates in teacher training courses published, for example, by the Federal Statistical Office (over the past few years +/- 10%) are not suitable for revealing how sobering the actual graduation rates are courses are. These calculations do not include changes in courses within and beyond the universities. Complex calculations reveal a decline in the course of studies of around 50 percent (!) (see Figure 3). This means that only about half of students end up where they had wanted to be at the beginning of their studies. Half of the other 50 percent change within the teaching profession segment or leave it. The resulting aggregate dropout rates across the various teaching positions are thus around 25 percent (ibid., p. 392f) (see Table 2).

Table 2: „Average attrition composition by type of teaching post“ (ibid., p. 391).

<i>Lehramtstyp</i>	<i>Wechsel mit Verbleib an der Hochschule</i>				<i>Exmatrikulation</i>	
	<i>Wechsel innerhalb des Lehramtsstudiums</i>	<i>Wechsel aus dem Lehramtsstudium</i>	<i>Urlaubssemester</i>	<i>Sonstiges</i>	<i>Wechsel der Hochschule</i>	<i>Abbruch</i>
<i>Lehramt an Gymnasien</i>	23%	16%	9%	1%	10%	41%
<i>Lehramt an Regionalen Schulen</i>	25%	12%	3%	1%	9%	50%
<i>Lehramt an Grundschulen</i>	8%	7%	11%	0%	16%	58%
<i>Lehramt für Sonderpädagogik</i>	1%	1%	26%	0%	18%	54%

So if 100 high school graduates start a teaching degree, on average only 75 of them go on to do a traineeship. This is predictably related to the previously explained professional perceptions within the course of study, but certainly also to the courses themselves. For decades there have been complaints – with regard to vocational teacher training courses – that the training as a whole takes too long, that the technical study and examination requirements are quite far removed from what is specifically required in schools, that as a student teacher you feel homeless among the students assigned to the disciplines, students feel that the subject didactics have too small a proportion of the studies and - due to the use of teaching assignments - are often hardly implemented at university level, and also that the courses often overlap in time, which makes it just as difficult to comply with the standard study periods especially regarding the gainful employment that is now unavoidable for many students (Tenberg 2018, p. 337). In addition, teacher training courses have been completely overtaken by the social and technological developments of recent years. Topics such as sustainability or digitization have hardly found a way in to the school curricula, and the same applies to the curricula of the universities as well as to their didactic concepts (Tenberg 2020, p. 31). Schwalbe et al. (2021, p. 61) reveal that coherence in particular is a central problem in teacher training courses. A distinction is made here between vertical coherence (ibid., p. 17), i.e. the course structure within a field of study (within science subjects, didactics and educational sciences) and horizontal coherence, i.e. the linking of the subject-specific, subject-related didactics and educational science parts of the course and the internships (ibid. 20). In terms of horizontal coherence, the specialist sciences mostly do well, while didactics and educational sciences fair far worse (ibid., p. 17). However, the actual deficiency is indicated in the vertical coherence. "On the other hand, only a minority of students in all subjects confirm that the three sub-areas of the course are linked" (ibid., p. 20). After all, it is also established here that the perception of coherence improves over the course of the course (ibid.), but if one assumes that the greatest loss occurs in the first semesters (Güldner et al. 2020, p. 388), this insight probably comes too late in relation to leaving a teaching degree.

So if you want to get more teachers into the schools and keep them there, both the teaching profession and the professionalization that is geared towards it need to be revised. It is not known whether or how education policy will react at federal or state levels. The KMK initially expressed itself with this SWK paper and may assume that with these recommendations it has done justice to its role as a transnational strategy body. In the spirit of our cultural sovereignty of the states, it

is now up to each of them to deal with it themselves, or not. What is certain is that even in the current crisis situation there are hardly any signs of improvement, because those responsible for this misery hardly see themselves as responsible, rather they simply pass the problem on to the bottom. At the education summit on March 14th and 15th, 2023, the shortage of teachers was not a core issue, and only two out of 16 ministers of education attended anyway. The Hessian Minister of Education Alexander Lorz explained his absence by pointing to overall unprofessional preparation and communication on the part of the Federal Ministry. In view of such absurdities in the face of a crisis with enormous potential for damage, the economy has now become aware of this. The *Stifterverband*, an organization of German companies for the promotion of education and science, has now got involved and opened a "Future workshop for teacher training" in order to unite actors from all phases of teacher training as well as representatives from politics, business and civil society to develop a master plan to set the course for sustainable and attractive teacher training. Although it is doubtful whether such a large-scale participatory process is really suitable for developing a consistently innovative concept, it shows that our society has started to tackle the crucial issues beyond a largely self-absorbed educational policy and administration. However, without the responsible institutions, and above all without the urgently needed funds, we will not make any progress here in the foreseeable future.

## 6 Monetary aspects

If you look at the problem from a monetary perspective, it becomes clear why education policy is as reticent as it is helpless in dealing with the decades-old topic. Nationwide, a total of 188.9 billion euros, i.e. 5.4% of GDP, are spent on educational institutions such as crèches, kindergartens, schools, vocational training and universities (Federal Statistical Office, as of Feb. 2023). The federal, state and local governments spend 74.2 billion euros, i.e. 2.1% of GDP, on schools alone. According to the Education Financial Report 2022, the majority of the burden lies with the federal states, e.g. NRW €18.7 billion. The high proportion that goes into the financing of the teaching staff can already be seen when subtracting the payments of subsidies and imputed social security contributions, then it is still €15.4 billion. Ultimately, almost 80% of school expenses are spent on staff, which is €59.36 nationwide or 1.6% of GDP. No wonder, then, that calculations are made with a sharp pencil, especially at the state level, as whole departments are busy and complex calculation models are used. Exact budgets are generated for each type of school, centrally based on the ratio of teachers to students. This results in the potential class size, which is a not inconsiderable parameter for the quality of education. Annual allocations are then calculated for the individual schools, with which these – depending on the degree of autonomy – have to budget more or less independently. The other side then also works with a similarly sharp pencil: head teachers are experts in securing posts, the more of them they have, the better they can fulfill their teaching assignment and the more flexible they are in planning. The fewer posts, the lower the allocation, the fewer teachers can de facto be employed, the more temporary workers have to be brought in, the more likely it is that colleagues from other disciplines will be used, the larger the classes, the worse the teaching, the more unpleasant working conditions, the higher the sick leave, which leads to even fewer teaching staff, etc. In view of these figures and the associated scenarios, our current educational situation can probably be understood much better from a monetary perspective than from a pedagogical or didactic one, similar to how the quality of music can hardly be judged from an artistic perspective if you try to play overly demanding pieces on cheap instruments. But back to the expenses. Education has always been an enormous budgetary burden, which is kept under

control as much as possible with great effort on the part of the financiers. What are the possible means of control of the ministries of education here?

As already described above, the so-called grant that goes to the schools and the underlying budgets for the individual school segments are of course central. That would be the demand side. But what about the supply side? Here, too, the ministries of the federal states have great influence, on the one hand in the co-financing of the study places through teacher training funds that are paid annually to the universities, on the other hand in the provision of places in the preparatory service that every teacher has to go through after graduation. Study places are financed within clearly defined frameworks, the same applies to traineeships, after all it all costs money. However, the calculation models are difficult here, because with about eight years of training, some things have to be anticipated (years of birth, fluctuations, demographics, etc.), which ultimately entails great uncertainty and - as the past decades have shown - generally use conservative calculations, i.e. it is better to spend too little than too much. The fact that savings have been made here for decades can be seen in the so-called special measures, which are handled year after year in the vocational shortage subjects of metal, electrical engineering and information technology. With these measures, which mostly take the form of shortened training courses with financial incentives, attempts are being made in the federal states to fill the gaps that the consistent austerity (education) policy has been systematically producing for decades.

This ongoing ignoring of a shortage with the continued use of cheap interim solutions is predictably not just a central cause of that teacher shortage. It has meanwhile also led to a fatal shift in the teaching staff of our schools. It is currently assumed that there are more career changers, lateral entrants and other replacement staff in vocational teaching than teachers with a basic education, although the quotas between the professional domains vary greatly. There are currently no precise findings on this – who would be interested in them? (!). In some cases, special measures are implemented in which non-specialists are also "qualified" to become teachers through fast-track procedures. In Brandenburg, legal conditions have been created in which a civil service as a teacher is already possible with a bachelor's degree. In Berlin it goes even further: "Teachers without full teaching qualifications" (LovL) are now being deployed, i.e. skilled workers, university dropouts, failed trainee teachers, university graduates of any subject without a teaching degree and without a suitable subject. They are qualified quickly, underpaid and employed on a temporary basis. The money that is saved here is not only at the expense of the students, but also at the expense of the people who get involved in such measures.

A comparison to other countries makes it particularly clear how much – or rather how little – education is worth to Germany (see Figure 4). Finland spends 5.2% of its GDP on education, 0.9% more than Germany (4.3%), Sweden spends 5.5%, 1.2% more than Germany (BMBF, 2022, Table C2.1). Converted into euros, these are enormous sums. If spending in Germany were to be increased to the level of Sweden, around EUR 43 billion (compared to the UK's EUR 61 billion) more could be invested in education every year. Forty-three billion on smaller classes, better equipment (especially digital infrastructure) or better remuneration for teachers, especially in the completely underpaid area beyond grammar schools and vocational schools.

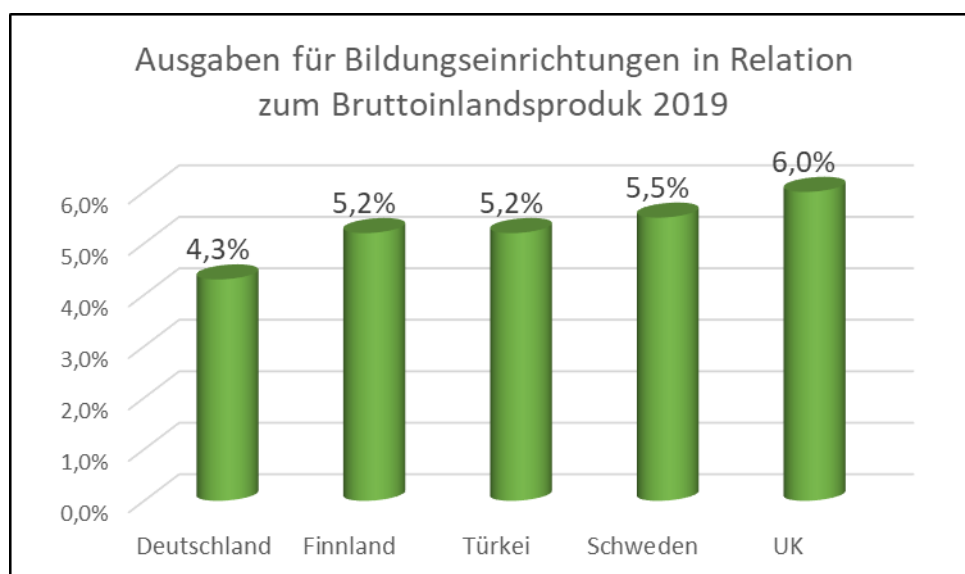


Figure 4: "Education expenditure in an international comparison" (Education at a Glance 2022 - OECD indicators, Table C2.1)

Although the decades-long austerity policy can be seen as one of the causes of the current teacher shortage, it does not necessarily follow that the problem can be solved simply with money. The current example in Bavaria makes it clear that attempts in this regard are being made, specifically by rich federal states. According to the cabinet decision, 1.5 million euros will initially be made available for a "regional bonus", i.e. for teachers from Bavaria or other states who go to a school region with a particularly high need for staff. For this they should receive a one-time gross payment of €3,000 (2023 – 2025). In addition, there is a relocation allowance for non-Bavarian teachers, flanked by a nationwide "advice service" which is intended to point out the better remuneration and supply conditions in Bavaria. Money is now being invested here, but not directly in education, rather, above all, in poaching teachers from other federal states, which, from an overall perspective, again results in a zero sum. Ultimately, this is proof of the lack of learning ability of our education policy, whose strategic horizon only rarely touches the core of the problem.

## 7 Outlook

It has become clear that a warning should always be given against implementing the recommendations discussed here. They have considerable potential for a further loss of quality in our education, an increase in the immanent deficits in justice, potential for frustration and stress for active teachers and further potential to deter future teachers, all coupled with a great deal of effort that could be put to better use. Lessons can only be compensated for with good teachers and they cannot be conjured up. Therefore I recommend...

- the identification of the causes and connections that are effective here in all their complexity and sophistication
- a combined processing of the didactic, pedagogical, school organizational and educational policy causes
- the generation of sustainable measures for sustainable and high-quality development, i.e. constantly more and better trained teachers

- the provision of the necessary funds for the implementation of the measures
- accompanying and controlling the implementation of measures through high-quality scientific monitoring

Instead of continuing to spend money on deficit and ineffective special measures or on cannibalizing the teaching staff of other federal states, it should be invested in a comprehensive reform of our outdated education system and the associated, also outdated system of teacher training. However, this has not been and is still not being addressed. Barrier no. 1 here is the already mentioned cultural sovereignty of the states. Instead of acting as the formerly intended motor for a continuously evolving educational landscape in Germany, this federal element has established itself as a kind of experimental field for party-politically tinged ideas, in which new things are constantly being introduced, but hardly anything is changed in the end. School in Germany is an autopoietic system that continuously reproduces itself without changing. Anyone who goes to school and attends classes will agree. All has changed very little since the beginning of our republic. Classrooms, timetables, colleges, frontal teaching, top notes, etc. But the overhead projector has been exchanged for the beamer. Of course, there are exceptions here, but these hardly ever arise or have risen from the system but are mostly individual one-off approaches by motivated schools or teachers. Other barriers lie mainly in the interest groups involved here. Some want to save money, others want to secure the civil service system, still others want inclusion, still others hold on to outdated teacher training, or they conserve our backward situations in the study seminars, etc. In this way, a master plan can but will hardly be created that gets things moving; instead, the divergent forces cancel each other out. We therefore need a reorientation that no longer tries to spice up the existing system a little but develops a vision for our education and school that does justice to the 21st century with all its facets and challenges, and in particular motivates those who are interested in the teaching profession for their own reasons. Based on the findings on the choice of profession and work motivation of teachers (e.g. Scharfenberg 2020; Glutsch 2019; Weiß et al. 2011), as well as on the workload (e.g. Čandová 2005), a very differentiated profiling could be carried out here - scientifically based. I already have an idea who could do it! Of course, the SWK, because – as already stated – there are high-ranking educational researchers who would be able to do this. You would only have to be given the order and of course a little more time than four months. We always have this time, because it makes little difference whether we maneuver around for a few more months, whether with or without implementing the SWK recommendations. In any case, I'm relatively sure that we could inspire more young adults to work in and for them and thus for our society toward a modern school of the 21st century.

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