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Discourse amid conflicting priorities

A case for contentious teacher education

Education is only ever meaningful if it leads to critical self-reflection.
(Theodor W. Adorno: Erziehung nach Auschwitz [1966 / 1986], p. 676)

Abstract. The role of teacher education at universities has become increasingly important. It has been recognised that in our digitised knowledge society, teachers will assume the role of major educational agents who ensure and realise 'education for all'. The teaching profession, however, has not yet gained the reputation it deserves, and what makes a good teacher is a highly controversial issue. This paper describes the multiple challenges faced by modern teacher education from a historical and a systematic perspective. These challenges result from disciplinary dilemmas and ideological debates over the status of teacher education at the university level in general and over the agents that shape and lead teacher education in particular: scientific disciplines, their didactics, educational sciences or a combination of all three constituting pillars. They also result from controversies over whether training in the (scientific) subject disciplines or an orientation towards the teaching profession and its practical aspects should take precedence. In addition, these challenges can be seen in fierce debates over how to define the concepts of *Bildung* (a complex German term that we have translated as *education* for the sake of brevity), 'knowledge' and 'competence' in a meaningful way. The complex status of teacher education is further aggravated by the fact that (federal) educational policy-makers frequently come to divergent decisions. The paper ends with a number of considerations that illustrate the importance of teacher education using the hands-on measures of the heiEDUCATION project and the overall concept of *education* of the Heidelberg School of Education.

Keywords. Leading disciplines in teacher education, challenges of teacher education, interlacing and networking, competence, knowledge, education

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Im Spannungsfeld der Diskurse

Plädoyer für eine streitbare Lehrerbildung

Zusammenfassung. Der Stellenwert der universitären Lehrerbildung, die sogenannte ‚Erste Phase', hat in der jüngeren Vergangenheit zunehmend an Bedeutung gewonnen, wozu die Erkenntnis beiträgt, dass Lehrerinnen und Lehrer in der digitalisierten Welt von heute zu den wichtigsten Vermittlern von ‚Bildung für alle' gehören. In Widerspruch zu dieser herausragenden Rolle steht die relativ geringe Anerkennung, die der Profession und der Professionalisierung von Lehrpersonen zukommt, zumal auch die Frage höchst strittig ist, was überhaupt ‚gute Lehrer/innen' ausmacht. Unser Beitrag setzt sich sowohl unter historischer als auch unter systematischer Perspektive mit den Herausforderungen auseinander, vor denen die Lehrerbildung in Deutschland steht. Sie speisen sich zum einen aus zahlreichen immanenten Dilemmata und bisweilen ideologisch geführten Diskussionen über die universitäre Lehrerbildung im Allgemeinen und über deren ‚Leitdisziplinen' im Besonderen: den Fachwissenschaften, den mit ihnen korrespondierenden Fachdidaktiken, den Erziehungs- bzw. Bildungswissenschaften und dem Zusammenspiel all dieser Komponenten. Zum anderen nehmen die Kontroversen darüber einen breiten Raum ein, welche Deutungshoheit (fach)wissenschaftlicher Bildung, Professionsorientierung und Praxisbezug, welche Geltung den Leitbegriffen ‚Bildung', ‚Wissen' (*knowledge*) und ‚Kompetenz' und welches Gewicht den staatlichen Entscheidungen der Bildungspolitik zukommt bzw. zukommen darf. Der Beitrag mündet in Überlegungen, die die Bedeutung der Lehrerbildung im 21. Jahrhundert mit konkreten Maßnahmen aus dem Projekt heiEDUCATION und dem Bildungskonzept der Heidelberg School of Education veranschaulichen.

Schlüsselwörter. Leitdisziplinen der Lehrerbildung, Herausforderungen der Lehrerbildung, Verschränkung, Kompetenz, Wissen, Bildung

Challenges and dilemmas

Few areas of public life are as fraught with contention and contradiction as schooling and education. This is true for many countries around the world, but particularly for Germany – a country that arrogantly calls itself a 'nation of the educated' and yet permits itself the embarrassment of dilapidated school buildings and the cynicism of a radical education-based social selection system (cf. Chancenspiegel 2017; Bonefeld, Dickhäuser 2018), even though it has an abundance of money and expertise with which to tackle these challenges. Although we believe that the importance of international education performance rankings is vastly overrated and that the resulting boom of educational reforms is sometimes nothing but a 'frenzy of activity' (Gaiser 2010, p. 385), these rankings do have their uses in that they sensitise the wider public to the meaning and responsibilities of the education system. Teacher education must be outstanding because it is of outstanding importance to the present and future of our society, indeed the entire world, if the educator to be trained – as Hannah Arendt saw it – is responsible for passing on world knowledge between generations and helps shape future life choices and possibilities. Such expectations, which both strengthen and exaggerate the role of educators, are no help in defining specific and concrete requirements for teachers. Rather, they represent a generalised ideal: teachers carry a major responsibility for the 'development of children and for the continued existence of the world' (Arendt 2000, p. 266), especially because in modern times schools have increasingly assumed or been given the task of enculturation which originally belonged to the family. Arendt goes on to say that, in line with this development, no one 'who does not want to take responsibility for the world [...] should be allowed to help educate children', because an educator's legitimacy and authority are based solely on the fact that he can 'offer instruction' about this world and 'takes responsibility for it' (ibid, p. 270). In other words, if we want a democratic, open-minded and humane society, we must give top priority to the development of well-informed and politically mature citizens who are able to think critically and act morally; we must fight for educational justice across the barriers of (social) background and set an example of being open to questions, challenges and contradictions because this openness is education's litmus test. The fact that, all too often, school is *not* that place, but rather one in which the great mental and human commitment of countless teachers and the intellectual curiosity, creativity and vitality of children and teenagers waste away in the undergrowth of institutional inertia and control, is one of the tragedies of an education system that owes its potential to an emancipatory impetus – the beginning of the adventurous journey to freedom: for 'to educate oneself', claimed the Romantic activist Bettina von

Armin in 1843, is 'nothing else than to become free' (von Arnim 1963, p. 93; cf. Härle, Rank 2008, p. 3–4).[1]

That is why it is both necessary and rewarding to take on the arduous task of dealing with the inherent controversies of teacher education and giving it its rightful place in the scientific community and in social discourse. Such efforts will only be successful if they are tackled with the quality, thoroughness and complexity of a sophisticated and committed academic discussion, in which we do not stumble from one 'innovation' to the next and, in our eagerness to change something, sometimes throw one or the other baby out with the bath water. The dilemmas are manifold and virulent in all areas of teacher education, from the smallest institutional unit, the 'subject', to the fundamental scientific positionings and the structures of the actual science of teaching, subject didactics. A critical discussion of these contradictions is only possible if we accept them as necessary integral components of a dialectic system whose processualism, diversity and incompletability are by no means weaknesses, but the conditions of its success, and of the success of education itself.

On the subject of subjects

No subject is just a subject. In an educational context, 'the subject' is characterised by at least three dimensions, each of them a complex structure in itself, that both complement and work against each other; they are all reflected in the term of the 'subject'. Firstly, the term presents the twin aspects of the subject as it is studied at university level[2] and taught at school – often, but not always under the same name,[3] but never with the same scope and depth. Secondly, 'the subject' incorporates the two qualities of being a scientific discipline and the associated teaching methodology, also known as subject didactics; their relationship, which is complicated by a vast range of different research positions and methods, is of particular importance in the current discourse on teacher education. Thirdly, as the genuine focal point and enabling space of all

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1   Novalis came to a similar conclusion in the 25th chapter of *Heinrich von Ofterdingen*, in which he declares that 'all education leads to that which we cannot call by any name but freedom – not a mere word, but the constructive reason of all existence'.

2   When we say 'university level', we refer to the academic character, not the institution, and take it to mean all forms of basic and continued teacher training that are offered or shaped by academic institutions of higher education.

3   University and school subjects with the same name include mathematics or history, while German studies / German or theology / religion are examples of subjects with different names; this is the result of historical developments and has nothing to do with the scientific system.

scholastic educational processes, 'the subject' ensures both the acquisition of specific knowledge, competences and skills and the general education of individuals as well as the development of their unique personalities. The same applies to the key role played by science in the professionalisation of teachers at the university level (cf. Hericks 2007, 2017; Tenorth 1999). In short, 'the subject' is a prism whose reflections shine a light on both the accomplishments and the contradictions of what operates under the name of 'teacher education', with its functional ties to 'schooling'. This concept of teacher education is a complex one that can only be grasped through constant engagement with its inherent dilemmas.

The 'subject', whose diverse nature carries within it the seeds of fragmentation, is pitted against a large, supposedly coherent conglomerate that unites numerous subdisciplines under the umbrella term of the 'educational sciences'. At the centre of this conglomerate are education studies and (pedagogical) psychology with their rivalling interpretations of the theoretical-hermeneutical and the quantitatively / qualitatively empirical research paradigms. Depending on the underlying federal state ordinance, they are supplemented by disciplines like sociology, ethics and political science, and by cross-sectional topics like inclusion and multilingualism.[4] The label 'educational sciences' therefore encompasses additional subjects that are present and taught at university, but not in school. Consequently, the knowledge and skills acquired in the educational sciences must also be effectively applied in the everyday school life and in the teaching of school subjects if they are to come to bear – a requirement for (future) educators that is frequently not met outside of practical school training. The same requirement was stated by the *Annual Meeting of the Commission on 'Profession Research and Teacher Education'* 2018 in Marburg:

> The vast majority of future educators specialise in certain subjects, which they go on to teach. However, this fact has been largely neglected in the systematic reflections and empirical investigations of profession research, beyond competence-oriented studies on teachers' knowledge of their subject discipline(s) and subject didactics. (DGfE Commission 2018b)

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4   The current framework ordinance for all teacher training programmes in Baden-Württemberg comprises the following disciplines under the heading of the 'educational sciences': 'pedagogy, psychology and sociology', as well as 'the basic philosophical, ethical and political questions of education and the Western educational and cultural values that are grounded in Christianity' (Framework Ordinance of the Ministry of Education and Cultural Affairs 2015, passim). Based on the associated ECTS credits, these must be supplemented with German as a second language, media literacy and media education, prevention, ESD and inclusion.

Although more strongly networked colleges and universities such as universities of education, teacher training colleges or integrative study programmes such as primary school teacher training attempt to overcome the boundaries between the individual components, student surveys show that the deficits exist even there, albeit to a lesser extent (cf. Baden-Württemberg Statistical Office 2014, p. 26–27).

It is also worth noting that the special 'extradisciplinary' status of the educational sciences corresponds with the quality of a 'metadisciplinary leading discipline' that is frequently attributed to them in their capacity as the 'actual profession science'. Their prominent role is grounded in the history of 'pedagogy', from which teacher education emancipated itself through the increasing 'subject orientation' of didactics and its relocation from 'pedagogical seminars' to universities since the 1970s (cf. Ossner 1999, p. 23–25). The more prestigious name of 'educational sciences' and the empirical approaches of profession research gathered under its umbrella reflect the attempt to rise above these somewhat humble beginnings (cf. Fromm, 2015, S. 8).[5]

The great diversity of all these functional profiles makes it difficult to integrate or 'interlace' the profession's different components in a convincing manner. This interlacing is a challenge yet to be met. It must be discussed with a view to the relational coordinates of the respective subject didactics and the breadth and objective of their cross-linking, on the one hand, and the integration of the educational sciences, on the other. While the educational sciences might contribute their competence to effectiveness research, this could be equated with a kind of 'supervision' of the subjects that would not be expedient in reality. Moreover, it would not be consistent with the idea of an equal integration of the components. On the other hand, the perspective of the educational sciences is also not adequately reflected if they are reduced to mere 'lesson planning' (Dehrmann et al. 2013, p. 13). These distinctions show that we have not yet adequately determined the objective and desired breadth of such (continued) interlacing, which undoubtedly revolves around the scientific disciplines and subject didactics, and the target groups for whom it is important. To arrive at an open and unbiased discussion, it is therefore indispensable to separate the theoretical prerequisites and implications from the political desire for pragmatic solutions and their organisational implementation.

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5   This also explains the aspirations of teacher training colleges, which today are limited to Baden-Württemberg, to be upgraded to 'universities of educational sciences'.

Science with a question mark?

In view of the existential importance of teacher education for the future of our society and the sciences, there is a certain tragic paradoxicality in the fact that, exactly 100 years ago, this education was to be relocated to special colleges in order to *embellish* it and outclass the 'sometimes questionable achievements of universities in this area' (Ossner 1999, p. 24, based on Eduard Spranger, 1919). The failure to establish a stable reputation is illustrated by the example of subject didactics. They often exist on the fringes of their institute's curricula or are taught as part of the educational sciences, reflecting their distance from the scientific disciplines on the institutional level, or they are delegated to state seminars in which they are largely uncoupled from research.[6]

The often contentiously debated question of *which* scientific positions and paradigms should be determinative for teacher education is eclipsed by doubts as to whether 'real science' – i. e. serious research – actually occurs in the primary domains of teacher education or whether this is even necessary. This problematisation, as insipid and obsolete as it may seem to members of the profession, permeates all areas and components of teacher training, including the scientific disciplines, if they appear under this label, which can sometimes be akin to a mark of Cain.

A brief comparison of past and present discussions reveals that this phenomenon is neither outdated nor a mere fad. One programmatic switching point in the historical process was the Hessian teacher education reform of 1999, which led Frankfurt-based education researcher Frank-Olaf Radtke to summarise the state of discussion – which, while quite virulent then, was already a quarter-century old upon closer inspection – in a pointed manner. He comments polemically on the suggestions for reform that were submitted 'yet again and in rapid succession' to the universities, where they 'met with widespread disapproval' and primarily had the effect of 'breathing new and vigorous life into old controversies' (Radtke, 1999, p. 5 [Preface]). These 'controversies' concerned the academic standing of teacher education and its implementation in universities, which 'perhaps [...] are not the best place for teacher education after all', as 'many genuine educators of teachers' had warned 'as early as the 1970s, being familiar with the nearly century-old debate on the organisation of teacher

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6   The model of the teacher training colleges bridges this gap by establishing close personal and structural ties between the scientific disciplines and their teaching methodologies. However, this model faces particular difficulties in upholding its reputation in scientific, political and public discourse.

education'. Radtke pointedly summarises the critical position in the rhetorical question:

> Has the integration of teacher education in universities failed? If so, what should be the consequences? Most universities and university departments would not shed many tears if teacher education were to move premises once again. (Radtke 1999, p. 10)

The situation echoes the *Winter Journey* song by Müller and Schubert – 'A stranger I arrived, a stranger I depart'; the 'strangeness' of teacher education, its inability to find a home anywhere, remains an essential tonic keypoint of the debate, which has resonated to this day by catchwords like 'centrelessness' (Bohnsack 2000) or 'fragmentation' and by the hope of establishing 'centres' in the form of *Schools of Education*. In the same context, and with a certain relish, Egon Becker points out the irony of the fact that the principles in effect around the turn of the millennium had themselves been outdated for a quarter-century:

> These principles call for *teacher training centres* to counteract the fragmentation of the subjects and the widespread disorganisation, and for a mandatory *practical semester* to guarantee the training's relevance to the reality of teaching in school. In addition, there are long lists of desirable qualifications for teachers to be considered. I have compared these suggestions and their rationales with essays and papers such as we wrote in the early seventies. The result: with a few modifications, we could have introduced these 25-year-old texts as concretisation of the latest reform suggestions. (Becker 1999, p. 47)

In view of this look back to the 1970s and of the almost identical principles set forth in the current *Qualitätsoffensive Lehrerbildung* (www.qualitaetsoffensive-lehrerbildung.de), it is hard to avoid the impression that teacher training is not so much a *disciplina semper reformans* as a *nunc stans* that has essentially been producing the same 'innovations' for at least 50 years. How closely today's fundamental questions resemble those of 50 years ago becomes clear when we look at both the funding guidelines of the *Qualitätsoffensive Lehrerbildung* of the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) of 10 July 2014 with their focus on institutional cooperation, content coherence and practical relevance (cf. Bundesanzeiger 24 July 2014) and the *call for papers* published in response for a 2018-meeting of the *German Society for Pedagogy*:

> The question of how scientific, didactic, educational and practical training aspects can be combined in the right proportions is a permanent topic in pedagogical and

educational policy debates over the reform of teacher education. One frequent complaint is the fragmentation of teacher training; many find that the training programme components offered by various scientific organisational units provide insufficient coherence of content. In addition, scientific disciplines, subject didactics and educational sciences compete with each other in terms of their significance for teacher education. (DGfE Commission 2018a)

Although the situation has calmed down in many ways, hardly anyone contests the necessity of academically excellent teacher education and many university subjects know that they could not exist without trainee teachers, there is a recurrent theme in the overall debate stating that the 'scientific nature' of teacher training is fragile in at least three respects:

(a) From the viewpoint of the scientific disciplines taught at university, which regard teacher training as being primarily or even exclusively pragmatic, without appreciable theoretical content,

(b) Due to the intervention of educational policy-makers, whose requirements and specifications result in a functionalisation of teacher education and

(c) On the part of many trainee teachers themselves, who often do not appreciate the necessity of an academically challenging education and, consequently, have unrealistic expectations of their studies at university.

Regarding (a): The frequently feared 'contamination' of prestigious scientific discipline(s) by contact or even interlacing with questions relating to teacher training is due primarily to the historically and systematically unstable situation of subject didactics and educational sciences. This is aggravated by statutory provisions, e. g. in federal state laws, that require professors in the field of teacher education to both have practical experience teaching in schools (possibly even at the expense of their research output) and assume a considerable teaching load. Such concerns are certainly due in part to petty snobbery; but another part, which must be taken seriously, is the understandable fear that free research – the original purpose of science – might be diminished in favour of vocational training that is not part of the primary academic profile. Kämper-van den Boogaart summarises this finding, based on Luhmann and Schorr (1988, p. 378), pointedly and with a subtle dose of polemics:

Luhmann, then, does not believe in practical science. This casts a particularly dubious light on a discipline whose adherents generally profess to be experts in matters of education: pedagogy. Consequently, Luhmann and Schorr characterise these experts' position regarding the scientific system based on '[…] the assumption that in a functionally differentiated society, education can never be science

and, hence, does not lend itself to scientific reflection. [...] That is why pedagogy, especially if it regards itself as the reflection theory of the educational system, and if it does this well, is not a science. An academic subject – granted. That concerns the organisation of universities and the salaries of professors. But not a scientific discipline like physics, chemistry, biology, psychology, sociology'. (Kämper-van den Boogaart 2016, p. 95)

Regarding (b): In their fundamental discussion "Empirische Bildungsforschung und evidenzbasierte Bildungspolitik" (empirical education research and evidence-based educational policy) (2017), Bromme, Prenzel and Jäger postulate a close connection between the inherently separate, and indeed (in the emancipation history of teacher training) frequently contrary discourse areas of scientific research and political pragmatism. They sound out the 'possibilities and limits of evidence-based educational policy and evidence-based pedagogical action' and agree that the 'expectations of the various public stakeholders (educational administrators, teachers, parents) with regard to science (education research)' is 'a determining factor of knowledge acquisition', because it gives the 'communication of results and perspectives in empirical education research [...] a key role in evidence-based educational policy' (p. 129). This prioritisation of educational policy in the educational sciences does not meet with unanimous approval in the community. During a conference on educational sciences hosted by the University of Cologne, the organisers accuse their 'prominent' colleagues in particular of a politically motivated diligence that they even document in the conference transcript with anecdotal evidence and ironic potshots. They note that the state of discussion

is characterised by an unfortunate asymmetry inasmuch as the expressly invited, prominent representatives of pedagogical-psychological teaching research had to cancel due to scheduling conflicts, because they were deep in preparations for the next PISA study. (Meseth et al. 2011, p. 7)

What weighs far more heavily than such a withdrawal, however, is the fact that Bromme, Prenzel and Jäger do not even pose the essential question of whether science with such close ties to *political* framework conditions can still support the 'freedom of research and teaching' required by the German constitution, such freedom being not just the privilege, but actually the *mandate* of the sciences. Neither aspects of social criticism or of the ethical responsibility of teacher education nor the reappraisal of subject research play a role in their somewhat positivist identification of the subject area of educational research, which is why they do not allow that the *scientific* disciplines of the 'subjects' have a part in empirical education research:

> Empirical education research benefits from the contributions of such fields as education studies, the various subject didactics, psychology and sociology, but also communication sciences, economics or political science. This description of the subject matter of education research is a broad one that largely coincides with the subject matter of educational policy and administration. (Bromme et al. 2017, p. 134–135)

This type of 'exclusion' is not unwelcome to many representatives of the scientific disciplines who 'cultivate their indifference to the education system as a sign of their autonomy and ideological independence' (Kämper-van den Boogaart 2016, p. 98) and who therefore must often be 'motivated' to take an active part in teacher education rather than including it just because they have to.

Regarding (c): Teacher education must assert itself not only within the scientific system and against educational policy in terms of its own scientific relevance, but also with respect to a widespread 'profession-related belief' among teachers in training. They state that many of the expectations concerning the students' educational attitudes and behaviours that are voiced by colleges and universities originate from the era of German idealism; expectations that Schelling outlined programmatically more than 200 years ago:

> No teacher worthy of his profession will demand recognition other than that which he can earn by his intellectual prowess, by scientific education and his eagerness to disseminate these more widely. (Schelling [1803] 1907, p. 558)

The reality of modern teacher education at universities is that students frequently follow a 'dissociation concept' and 'deny that scientific studies are in any way linked to teaching', which negatively affects their study behaviour, academic success and professionalisation (Winkler 2015, p. 200). This negative view is supported by a recent empirical study involving 251 teachers in training, in which the test subjects were found to have 'a fairly low work load [...] compared with standardised requirements', while nevertheless perceiving their work load

> as being high. Negative factors that are perceived to make a content-related discussion difficult and limit the time devoted to studies include aspects of study organisation and irritations over the usefulness of an academic degree for teachers, in particular. (Flender et al. 2017, p. 174)

These three challenges to the scientific nature of the overall complex of 'teacher education' contribute to its precarious position, on the one hand, and – as part of compensatory efforts – fuel the tendency of increasing scientific requirements,

the level of research and translation performance.[7] In this context, the empirical paradigm is frequently seen as the gold standard, because supposedly, 'the principles of empirical research […] are the toughest benchmark of scientificity' (Frederking, Brüggemann 2012, p. 18, note 13). The power struggle between the natural sciences and the humanities over the dominance of a world view (cf. Bernal 1946), thought to have been overcome long since, apparently rears its head again in today's teacher education and brings with it a new level of dogmatisation, instead of enabling the parties involved to justify their respective positions with their own respective epistemological interests. In view of the parties' fear of losing power in the debate, one might diagnose this phenomenon as 'identification with the aggressor' or as the hope for a solution to the old self-worth problem of the humanities, which can now generate similarly 'objective' research results, and therefore certainties, as those that contributed to the extraordinary success story and rapid application of the natural sciences since the 19th century. At all events, the bias towards a possible, but by no means superior, scientific model has significantly deepened the trenches in the discourse on teacher education and continues to fester at its heart, as evidenced by the position debates of subject didactics, among other things.

Subject didactics betwixt and between

The concept of 'subject didactics' eludes attempts at a simple definition or at highlighting its plurality. But didactics, too, are in a constant process of constitution, revision and self-assertion, i. e. they never simply *are*. Ever since they emerged as independent scientific disciplines from the methodologies of the (school) subjects, their intermediate position has created problems. As sciences of mediation, didactics are thought to be subordinate to the scientific disciplines, as exemplified by the lower value attributed to elements like 'teaching and practice' that are used to one-sidedly define subject didactics, compared to the elements of 'theory and research' which the scientific disciplines claim for themselves. This view is additionally supported by three factors: the imputation that teacher education is mainly the task of *pedagogy*, the lack of support for junior researchers in subject didactics and the legal requirements for the staffing of professorships in didactics. The fundamentally precarious position is also – as outlined above – the result of stronger ties to politics and the exploitation of teacher training disciplines compared to the 'purely' scientific aspects of

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7   A vivid indicator of the attempt to improve the discipline's scientific renown is the change of the original title 'Fachdidaktik und Wissenschaft' (subject didactics and science) to 'Fachdidaktik als Wissenschaft' (subject didactics as a science) in the new edition of Kämper-van den Boogaart's important contribution to German subject didactics (2006, 2016).

the same disciplines. Where originally the sciences were regarded as the foundation of academic knowledge,

> now an objective is introduced as a regulative factor against the intrinsic logic of the sciences. This objective is defined by the term *general education*. General education, then, is the filter that sorts the relevant scientific knowledge and determines which parts of it should become academic knowledge that is imparted in schools. [...] the sciences themselves have no decisional authority in this process (...). (Kämper-van den Boogaart 2006, p. 80)

With the so-called 'empirical turn', the unstable situation of subject didactics, whose 'existence at university is tied to their function in the education system – teacher training' (ibid.), developed a new and fast-paced dynamic that has grown in importance over the past three decades. This dynamic marks a general reframing of the discussion that rejects the idea of compelling reason or necessity arising from the *science* perspective alone, making a rapprochement between the positions considerably more difficult. This power shift in the debate also moves the focus away from the formation of hypotheses and the development of concepts and towards research results and their verifiability. This is a momentous development for subject didactics and – in the emphatic words of Terhart (2012, p. 139–140) – they must now 'justify the confidence placed in them' or 'the credit of trust received' by 'taking part in research and development processes at the national and international level'; only in this way can 'the situation of subject didactics be secured and rounded out'.[8] This development is further aggravated by the implicit stratification within the 'empirical paradigm', where quantitative methods are regarded as more valid or meaningful than qualitative ones, while both together set themselves apart from humanistic, theoretical and critical positions on education. In this context, subject didactics in the humanities have an even harder time asserting themselves in the discourse, because the old front line between scientific disciplines and subject didactics has now shifted to the (sub)disciplines of didactics themselves.[9] For the paradigm change intended by educational policy and educational science is by no means a mutually recognised transition from worse to better; in some areas, it is a real make-or-break test to which the humanities feel particularly vulnerable and sometimes even – when it comes to research funding, for instance – utterly exposed. The Israeli historian Yuval Noah Harari comments ironically on this

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8   When viewed critically, the reference to ensuring the survival of subject didactics is not a scientific argument, but rather one arising from structural and professional policy.

9   The danger of marginalisation is incidentally also being discussed with regard to scientific theories within the educational sciences that have not adopted the empirical paradigm.

'inexorable shift towards the "exact" sciences' by embellishing his criticism with a deliberately absurd punch line aimed at the discipline of psychology:

> Confucius, Buddha, Jesus and Muhammad would have been bewildered if you told them that in order to understand the human mind and cure its illnesses you must first study statistics. (Harari 2015, p. 316)

Such major 'swings of the pendulum', which are not infrequent in the history of the sciences, are usually reactions to certain aspects being underrated in one period and result in the same aspects being overrated in the next period.[10] As the following example of German didactics shows, some representatives of subject didactics attempt to bridge the gap by reconciling the humanistic with the qualitative empirical paradigm – their efforts, however, are clearly tendentious:

> Together, subject didactics, scientific disciplines and pedagogy / educational sciences form the three essential pillars of teacher training at university. However, the scientific self-conception of subject didactics is still fairly heterogeneous. While the didactics of the natural sciences are able to adapt fairly easily to the ongoing paradigm shift towards empiricism, didactics in the humanities have a much harder time. […] One essential factor, in my opinion, is the scientific self-conception of German didactics, which has still not been adequately defined. (Frederking 2014, p. 109)[11]

These controversies do not occur in the non-political sphere of the construct of a 'pure science', but correlate strongly with the changes in social values that strengthen neoliberal pragmatism and the functionalisation of concepts and people. The Klieme expertise, for instance, openly refers to the relationship between restrictive economic policy and the empiricisation of the educational infrastructure:

> Since the 1980s, in the wake of the output-oriented educational reforms initiated by the Thatcher administration and continued by New Labour, stakeholders there

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10   When Brüggemann (2013, p. 169) interprets the issue of scientific methods in subject didactics as a rebellion of the 'heretics' that follow the empirical paradigm – and are thus naturally 'progressive' – he elevates his own position to a Galilean affirmation against mindless orthodoxy.

11   The succession of adjectives in the title of the paper "Deutschdidaktik als transdisziplinäre, anwendungs- und grundlagenorientierte empirische Wissenschaft" (German didactics as a transdisciplinary, application- and basic research-oriented empirical science) marks the exaggerated attempt to attribute broad topicality and significance to subject didactics by reciting the complete list of keywords.

have been working on national curricula and school performance assessments. (Klieme et al. 2003, p. 31)

In simpler, slightly polarising words: ever since the 'empirical turn', subject didactics have been characterised by two opposing basic principles that have little in common, view the relevant questions from contrary standpoints and hardly communicate with each other – and when they do, they are more concerned with stressing their differences than finding common ground (cf. the in-depth overview provided by Kämper-van den Boogaart 2016 and using German didactics as an example). The term 'education' used by all parties turns out to be quite mercurial, in that it takes different shapes depending on the context and so keeps frustrating all attempts at a fixed definition:

1. In the case of *subject-oriented subject didactics*, the claim to scientificity lies primarily in the selection of *specific* subject-related topics that are regarded as having *educational value*. The orientation towards the latest theories in the respective scientific discipline is indispensable, as it gives rise to concepts of mediation and acquisition and their reconstruction with a sound basis in *education theory*; ties to other sciences are of secondary importance (cf. the 2017 Conference of the Ministers of Education and Cultural Affairs).
2. In the case of the *subject / domain didactics*[12] *orientated towards the educational sciences*, the claim to scientificity lies primarily in empirical effectiveness research. This research defines the *competences* that future teachers must develop to be able to act professionally in school and guide pupils to develop competences of their own. The scientific disciplines are mainly tasked with preparing *exemplary topics* from the school curriculum.

As a tendency, these antagonistic rather than complementary movements have given rise to two major types of subject didacts: The *didact orientated primarily towards educational science perspectives* with (implicit) connections to a subject or subject domain, where the content is *exemplary* topics based on which competences are developed; and the *subject didact oriented primarily towards a scientific discipline* with (implicit) connection to the educational sciences, where the content selected should be specific to the subject and have *educational value*. The difference, according to this definition, may be marginal, but it has a significant impact on the system of subject didactics and defines the respective questions, concepts and objectives.

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12   We speak of 'domains' within subject didactics whenever there is no correlation with individual subjects, but with subject conglomerates that have common *principles* from which appropriate competences may be derived (for instance, 'natural sciences didactics').

The benefits and drawbacks, epistemological possibilities and weaknesses of both types are obvious: While a principal orientation of didactics towards the educational sciences threatens to blur the outlines of in-depth, theoretically up-to-date subject expertise, a more subject-oriented teaching methodology pays too little attention to the specific requirements of schools and to matters of educational justice and effectiveness.

Topic-oriented and subject theory-oriented subject didactics

In his book *Didaktik der deutschen Sprache* (didactics of the German language), a ground-breaking work for the history of subject didactics, Hermann Helmers already postulated that the 'content selected for educational processes must be subject to constant review regarding advances in the sciences' while ensuring that the classroom 'does not turn into a stamping ground for unsubstantiated [...] theories' (Helmers 1972, p. 41). According to him, the continued didactic development of scientific topics must always reflect and integrate, but also critically scrutinise, current research. This, rather than the pure 'imparting of knowledge', is what Helmers sees as the essential 'didactic question of the educational value' of a teaching topic (ibid., p. 42), which Tenorth (1999) declares to belong solely to the *scientific disciplines*.

The position of subject didactics as 'subject-related', as it is outlined here, cannot be appropriately described with the German term *Abbilddidaktik*: This term denotes the intention to devalue topic-oriented considerations in subject didactics with the argument that they are used to directly reproduce the *system of a scientific discipline* in school teaching, with this system being made manageable only by forms of 'didactic reduction'. To what extent scientific subject didactics have actually conceptualised this view or to what extent these are crude attributions that may be derived from 'didactic custom' is a subject for another paper. On the part of today's didactics, such claims are at most met with irony, as in the rhetorical question 'Subject didactics – a small science for small people?' (Kämper-van den Boogaart 2016, p. 91). The nonsensical nature of such forms of reproduction is evident.

Despite the necessary dissociation from reductionist viewpoints, the essential nature of subject didactics – particularly as concerns their relationship with the corresponding scientific disciplines – remains noticeably vague, more an open question than a conclusive answer. One approach to a definition is by conceptualising subject didactics – like 'the subject' itself – as a generator and catalyst of interdisciplinary and transdisciplinary approaches to scientifically relevant

questions, with all the uncertainties inherent to dialectical thinking. Under this premise, the problem of the reference sciences is not an institutional or structural problem of the *subject system*. Rather, the relationship must be outlined qualitatively based on subject *research*, which is what we try to specify with the terms 'topic- and subject theory-oriented'. Without his orientation, subject didactics – regardless of the targeted school type or level – loses its specificity and depth of focus, as well as its importance for the present and the future. This dimension of research topicality is missing from both the criticised *Abbilddidaktik* and from the 'COACTIV model', as it is neither integrated as a complementary element nor as any form of 'knowledge content'.

The goal of teacher education that is orientated towards subject research gives rise to tasks for the scientific disciplines and for subject didactics that must be clearly outlined and generally addressed independently of non-scientific requirements. Under this premise, the *scientific disciplines* must meet the requirement of adapting themselves in a deliberate, targeted and differentiated manner to their tasks in teacher education and, therefore, of addressing specific research and educational topics, because it is not true, as some have claimed, that important questions and methods of a subject can be learned using *any* topic as reference. Instead, the subject-specific content that is relevant to advanced educational processes must be identified and communicated. The requirement to be made of *subject didactics* is to familiarise themselves in a deliberate, targeted and differentiated manner with current subject research and integrate this research into didactic conceptualisations and effectiveness studies. As an intermediary discipline, subject didactics ensures the interlacing of the profession components, which must take place at the level of current research in the scientific discipline – not at that of the school curriculum – to counteract the stagnation of education in school.

Subject didactics orientated towards the educational sciences

One essential characteristic of subject didactics that are orientated towards the educational sciences is that they do not primarily develop didactic concepts, but aim at investigating and fostering learning processes based on empirical cognition and learning research. The associated competence-oriented empirical studies are designed to define the intended learning results in more detail and validate the actual outcome for the purpose of optimisation (cf. Bauer, Prenzel 2012). This intention, which is focused primarily on the pupils, reflects back on teacher education, which is charged with the task of 'professionalising' future and present teachers in accordance with the maxim 'good teacher education makes

for good teachers! Good teachers deliver greater learning success to their pupils!' (Terhart 2006, p.35). In view of the countless variables involved in learning and educational processes, this tenet can be neither proved nor disproved, but (perhaps for this very reason) turns out to be very powerful. Nevertheless, we must admit that, in spite of all relevant research efforts, which have been intensified not least due to the *Qualitätsoffensive Lehrerbildung*, we still know too little about what allows teachers in training to learn successfully and there is no empirical data proving the effectiveness of university offerings and measures. Based on available studies, we can, however, identify a number of deficits with regard to academic success: For instance, universities frequently fail to imbue teachers in training with the scientific, research-oriented attitude they need to base their actions on theoretical knowledge (cf. for example Czerwenka, Nölle 2001; Lipowsky 2006; Messner 2007), continue educating themselves or contribute to the process of knowledge building (cf. European Commission 2007) or develop a (self-)reflective attitude (cf. Wyss 2013). Another desideratum is the continued training of active teachers, which, being the domain of the education and cultural affairs bureaucracy, is as yet hardly integrated into the academic sphere. In light of this focus on politically desired results, fundamental problematisations of this approach to professionalisation are relegated to the background; contrary to the orientation of the competence paradigm towards *success*, these problematisations want to see *satisfying experiences* at the centre of successful learning processes – particularly in the humanities (cf. Kepser 2012, p. 74–75).

The trend of measuring the competences of (future) teachers and correlating them with education characteristics or indicators of learning success in pupils (cf. for instance Blömeke et al. 2013; Kunter et al. 2011) developed additional explosive force in the wake of the PISA studies. Aggravated by the widely discussed results of international comparative school performance studies, especially in the subjects of German and mathematics, a justified reservation against conventional subject-didactic positions began to spread after the 'empirical turn'. The reservation stated that until that turning point, these positions had focused solely on the *development and improvement of concepts*, but not on the *verification of their effectiveness*. While this criticism may be appropriate, even empirical studies cannot establish clear correlations between general learning arrangements and individual learning results because they may be hampered by fundamental limits. That is why critical educational science and system theory problematise the objectives of these research positions, which want to increase the success of pedagogical actions by means of evidence-based processes. Even in 1982, Luhmann and Schorr pointed out the lack of a linear causality between the intention of an educator or teacher and the effect on the

learners or the educated; they stated that learning processes can only ever be encouraged, but never directly achieved. Luhmann developed this position further and postulates generally that education and teaching must always deal with the phenomenon of (double) contingency, i. e. the fundamental uncertainty and indeterminateness of human agency (2012, esp. p. 191–240; cf. Giesecke 2004). Regardless of such fundamental objections, empirical educational research and the associated subject didactics are interested in supporting learners through competence-oriented training programmes with suitable outcome tests, on the one hand, and investigating teaching by means of intervention and/or observational studies, and in the connection between professional attitudes ('professionalisation') of teachers and the learning success of pupils, on the other.

Professionalisation between desideratum and hegemony

In light of the complex relationships discussed up to this point, it seems surprisingly anachronistic that the almost hegemonistic model of professional teacher education postulated by Baumert and Kunter (2006), which has been discussed in Germany – and only there[13] – for the last few years does not take appropriate account of the dimension of 'the subject', either in its central position or in its complex challenges and effects. This claim to dominance is also demonstrated by the fact that no current discussion relating to subject didactics can do without reference of any kind to the COACTIV model, even though this model actually only claims applicability to the mathematical-scientific sphere.[14] Conversely, we can observe that subject-didactic positions play no role in debates relating to the educational sciences – they simply do not come up. This means that those who want to keep up with the times squeeze their didactic concepts into the Procrustean bed of the COACTIV model, even though it originates from a rather conventional positivist academic tradition and primarily serves not the conceptualisation of education, but the objective of making the 'professional' empirically measurable. In its intentions, it is functional, undialectical and ideological; contrary to common belief, it is less innovative than antimodern in terms of the underlying scientific theory. The model subsumes all subject-related 'facets' under the term 'knowledge', which in turn appears as 'content':

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13   We owe the information regarding the special position of the COACTIV model in an international comparison to a lecture of subject didact Prof. Peter Gautschi of Lucerne, which he gave during the Summer School of the Heidelberg School of Education on 10 July 2018.

14   Even in music education, focused as it is on creativity, there are documented efforts to adaptively fill the model with individual content (cf. Hofmann 2014).

> Regarding profession-related knowledge and its characterisation, a division into three knowledge areas has gained widespread acceptance: content knowledge, pedagogical content knowledge and pedagogical knowledge. (Günther et al. 2017, p. 219)

It is inevitable that models should simplify complex facts. Nevertheless, a scientific, critical discussion of the COACTIV model is made even more difficult by the fact that the terms used within the model are not clearly defined. This applies to the equalisation of the German term *Wissen* with the English *knowledge* as it does – and this is even more serious – to the lack of differentiation in the meaning of the term 'content'. While in many subject-didactic approaches the term 'subject' ties together the aspects of (scientific) subject discipline and subject didactics, the model categorially separates subject didactics from the subject, a dissociation that is aggravated by the English translation, which places the field of subject didactics in the *pedagogical* domain.
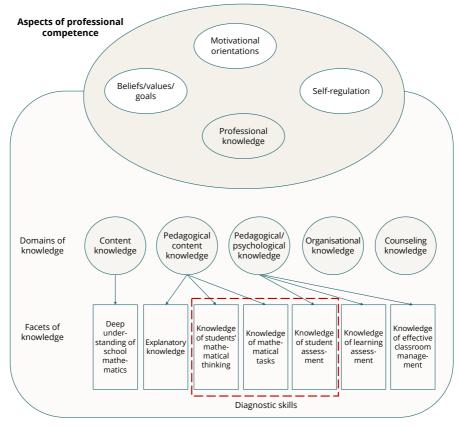

Figure 1: The COACTIV model according to Leuders et al. 2018.

The COACTIV model reproduces the rigid 'pillarisation' of teacher education, with its criticised lack of interaction between the components of scientific discipline, subject didactics and educational science(s) through the no less rigid 'pillarisation' of the three *knowledge* areas and facets that are usually termed 'knowledge' (Wissen) and in some adaptations also 'competences' (*Kompetenzen*) (cf. Haussener 2014). The model provides some important information as to the meaning of 'content knowledge', using the subject of mathematics as an example. The term denotes content that originates primarily in school curricula ('school mathematics') and not in current questions of the reference science. In this orientation, the university education system surrenders control over issues to norm-setting entities that are dominated more by political, legal and ideological than by scientific criteria. While the 'educational plans' drawn up by commissions under the direction of the Ministries of Education and Cultural Affairs have a socially (somewhat) legitimised orientation function, they should be an *object of critical debate* instead of the *main criterion for content definition* in university teacher training (cf. Reichenbach 2008).

Moreover, the term of knowledge, central to the model, is in itself remarkably contradictory, as indicated by recent remarks from the model's co-author Mareike Kunter. In an interview with the weekly newspaper *Die Zeit*, she explains that '40 years ago […] there [was] still a canon of knowledge imparted by the teacher that was important to prepare pupils for certain professions' (Kunter 2016). In this quote, 'knowledge' seems to belong to an outdated category, where this critical opinion attributes a function to 'knowledge' that does *not* apply to school tradition, i. e. to 'prepare pupils for certain professions'. On the contrary: school teaching traditionally aimed at providing a *general education*, while the shift to empirical education research postulated by Kunter accelerates the orientation of the school system towards and based on economic requirements, i. e. the 'misuse of teaching for economic purposes' (Münch 2009, p. 41; cf. Kissling, Klein 2011). Further on in her argument, Kunter distinguishes between this traditional definition of knowledge and the modern acquisition of competences, although the simplistic disparagement of 'rote memorisation' that, according to her, was customary practice in the nebulous 'past' seems a bit bizarre and far removed from reality:

> Today we must face the fact that we do not even know many of the professions that children will one day take up. Where before we had lesson plans and curricula, today we are teaching competences and skills, not facts to be memorised. Teachers must diagnose learning disorders, write individual education plans and support parents to an unprecedented extent in the raising of their children. (Kunter 2016)

However, a certain type of 'knowledge' does play an important role in professionalisation, according to Kunter, even if she limits it to a single domain: teachers must have 'sufficient *pedagogical content knowledge* to act professionally and reflect more on their own actions and attitudes' (ibid., emphasis added by BB/GH). This brief reconstruction of the argumentation shows in nuce the concepts underlying the central term of *knowledge* in the model. The term offers no room for aspects of scientific research in its entire breadth and depth, for the essential educational dimension of development, for the ability to take criticism, for questions of value orientation and for individuation, all of which must be regarded as essential components of professionalism in teachers. In other words, a concept of *knowledge* that blocks out the Socratic dimension of ignorance and a concept of *understanding* that neglects the non-understanding that is Humboldt deems necessary cannot be regarded as authoritative for the concept of excellent teacher education.

Two measures – one education concept

Admittedly: In light of the *nunc stans* of ever-repeating debates and controversies, one might become weary of the entire subject of (teacher) education. For this reason alone, one can understand the longing for feasible solutions and clear decisions in favour of one of the scientific paradigms in order to both escape the time loop and catch up with the zeitgeist. Nonetheless, the much-propagandised orientation of teacher education towards empirical education research does not solve existing problems, but actually creates more dilemmas. This is by no means intended as an objection, as this orientation also leads to more points of view, sharper contradictions and more in-depth questions whose examination should be the property of teacher education. That is why we believe that, in view of the line of argumentation to date, it would be a mistake to work towards an outcome that would be in any sense a 'closure'. Instead, we must *open up* different approaches to existing dilemmas in order to translate them into scientific dialogue and so resolve them dialectically. In doing this, we neither want to exacerbate the divisiveness of the debate and widen the gap between the positions nor propagate premature harmonisation, 'great irritation' (Pörksen 2018) or short-term political activism. What we need to do is listen and talk to each other with genuine interest and across disciplinary boundaries, which requires a strategic and structural framework that we outline based on two concrete examples in Heidelberg:

- The structural, content-based and curricular interlacing of scientific discipline, subject didactics and educational sciences in subject-related clusters and in the compulsory interlacing module of the Master of Education and
- The establishment of the hitherto neglected 'digitisation of teacher education' as a cross-sectional topic for all performance areas at the Heidelberg School of Education.

These measures deploy their strength in the educational concept of the cross-university academic institution that is the Heidelberg School of Education (HSE), in which Heidelberg University and Heidelberg University of Education cooperate on an institutional and strategic level to guarantee excellent academic teacher training (www.hse-heidelberg.de). HSE offers teacher education in Heidelberg a common programmatic home that secures its outstanding role in addressing the major social challenges of our globalised and digitised world within the context of the university.

Interlacing in the 'heiEDUCATION clusters' and in the 'interlacing module'

The process of correlating current research and innovative developments in a scientific discipline with those of the corresponding subject didactics and, if possible, with educational-science and profession-specific positions is risky, complex and time-consuming. It requires a new definition of target groups and objectives, and its success depends mainly on the motivation, willingness to cooperate and interdisciplinary openness of everyone involved. The different competences, strengths and cultures of these stakeholders represent an invaluable resource.

To realise its ambitious objective of *research-oriented teacher education involving all subjects*, HSE has, within the framework of the *Qualitätsoffensive Lehrerbildung*, established five subject-related heiEDUCATION clusters that involve collaborators from both academic institutions and external stakeholders from the field of continued education and from all school types as dynamic units. Together, the clusters form a common network structure ('cluster forum'; www.hse-heidelberg.de/forschung/heieducation-cluster); with their different communication formats, they offer an enabling space for interdisciplinary research projects and the resulting teaching-learning concepts. The scholars develop research- and profession-oriented formats that are then tested in teacher training programmes and developed into sustainable teaching concepts.

The structural integration of the 'interlacing approach' in the curricula of the joint 'Master of Education with a high school (Sekundarstufe I) teaching degree or grammar school (Gymnasium) teaching degree' is of particular strategic importance.[15] The new degree programme regulations include a compulsory *interlacing module* carrying at least 6 ECTS credits per subject. The module contains courses that connect scientific disciplines, subject didactics (across universities) and educational sciences. This 'interlacing' may be more or less pronounced, in accordance with the four structural types defined in Heidelberg – additive, consecutive, integrative and application-oriented interlacing (cf. Härle, Busse, Mahner 2018, p. 275–278).

In this way, the HSE objective is operationalised across all subjects and subject combinations, highlighting the scientific foundation and research orientation of teacher education and the unity of research and teaching more strongly than ever before. The module intensifies scientific cooperation between lecturers and professors of all involved institutions and helps students understand the complex relationships between the different components of teacher education. It enables them to link scientific knowledge and skills with concepts of research-oriented subject didactics and to reflect on them for the purpose of research-oriented learning. HSE provides project funding, various online tools and advice to support the subjects in the initially resource-intensive implementation of these curricular innovations.

Digitisation in teacher education at HSE

The buzzword of 'digitisation in / of teacher education' currently permeates a discourse that is characterised by a multitude of opinions and by more or less irritated or knowledgeable or know-it-all comments from numerous education stakeholders. Positions range from the belief that digital education is the necessary, future-oriented panacea for the 'digital educational revolution' (Dräger, Müller-Eiselt 2017, p. 28) that will 'radically change our education system' (ibid. p. 23) to sceptical assessments of its meaning for the modernisation, continued development and improvement of teacher education. Understandably, the public, political and scientific debate is characterised by helplessness and ignorance regarding the exact meaning of this buzzword or even of the term 'digital education', if it is to be something other or better than updated, critical media education which must now, after years of somnolence, be

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15   After the reforms in Baden-Württemberg and the changeover of all teacher training programmes to the tiered structure, the Master of Education programmes will be launched on 1 October 2018 (cf. Framework Ordinance of the Ministers of Education and Cultural Affairs 2015).

advanced conceptually and structurally with greater urgency. The commercial and participatory success of private digital education providers such as *better-marks* or *Khan Academy* (cf. ibid., p. 20, 47–48) seems to confirm this goal, as they deploy big data, algorithms, learning analytics and learning software to fulfil, apparently, the promises of digitisation: individual, time- and location-independent learning, democratising 'education for all!' (ibid., p. 30) or a 'data-based optimisation of learning paths'. What is as yet unclear is whether, in addition to offering the accumulation of facts, these concepts trigger actual educational processes.

In accordance with the established political credo, digitisation in schools is a signature project for every government, although concrete efforts aim more at installing Wi-Fi access points and purchasing digital devices than at answering basic questions on possible changes of the educational infrastructure due to the development of 'artificial intelligence'. In line with this prioritisation, the current federal commissioner for digitisation went on record with the somewhat flippant remark that it was '[b]etter for pupils to read Goethe's Faust on a tablet than some pointless trash on paper' (News4Teachers 2018), relegating a potential scientific examination of this complex issue to the back of the queue. Moreover, educational policy-makers are once again neither engaging in a comprehensive, equal discourse with the stakeholders of teacher education in schools and universities nor supporting them sufficiently in their tasks, which means that the digitisation of all spheres of life is hitherto not adequately represented in the context of schools and education (cf. Monitor Lehrerbildung 2018; Conference of the Ministers of Education and Cultural Affairs 2016; OECD 2015; Baran 2016; for critical opinions cf. Fish 2012; Thiel 2012).

With its 'HSE Go Digital Now!' concept, HSE has begun to see the digitisation of teacher training as both an opportunity for innovation and a challenge to education that must be tackled by today's and tomorrow's teachers. Against this background it has outlined digitisation conceptually, strategically and structurally as a high-priority cross-sectional topic in teacher education and oriented it towards four objectives of high social relevance and topicality: teaching media and digital competence, enabling learners to use digital media critically and in a didactically sensible manner, developing teachers into *digital mentors* and using digital media to interlace the different components of teacher education. In essence, the aim is to establish a scientific discourse that is both research- and profession-oriented and deals with

- innovations that take account of the digital transformation in teacher education,

- knowledge about digital processes and their various consequences, ethical-moral implications and questions of an emancipated, education-appropriate and democratic 'cooperation between man and machine' and

- innovative and creative forms of digital knowledge transfer and skills acquisition and suitable tools for prompting (individual) educational processes for the purpose, among others, of *visible teaching and learning* and the interaction of all stakeholders across the stages of teacher education.

Activities to this end are already under way at HSE, including interactive use of digital media such as online self-assessments and online consulting tools, the additional media qualification for present and future teachers and pilot events on the use of e-portfolios during on-the-job training. In addition, the school is establishing specific courses and research projects in the area of research/teaching/innovation that deal with the critical-reflexive use of digital media and the challenges and opportunities of the digital era; starting in January 2019, these courses and projects will be strengthened by a new *heiEDUCATION junior professorship for digitisation*. The objective of an improved infrastructure is achieved with the establishment and long-term scientific and technical development of the 'HSE Digital Teaching and Learning Lab' – a real room with media and technical equipment *and* a digital-virtual space in the sense of a creative service, test, exchange and networking centre that will contribute to research, teaching, transfer and innovation in support of 'teacher education in the digital world'.

Education through experience. An educational concept

The concept of Heidelberg teacher education outlined here would remain without proper substance if it were not integrated in an educational concept that provides it with a theoretical foundation and an ethical framework. Contrary to initial concerns, the advance of the empirical paradigm in teacher training has not eliminated the educational approach. Instead, the orientation towards competences that accompanies empiricisation sharpens the awareness of the 'dichotomy of the term "education"' that manifests itself in two antagonistic aspects. In a school context, we often find that the term 'education' is defined and understood, to its own detriment, as the 'acquisition of educational *knowledge* and educational *content*', whereby it becomes a process of selection. The notion, arising from didactic custom and institutional power, of *education as property* directly contradicts the tradition of Enlightenment, which refers to Wieland, Goethe and Humboldt to characterise *education as a process* and a

way of opening oneself that, far from being equivalent to the imparting of knowledge, both goes beyond and to some extent opposes it. The umbrella term of *standards of education*, which stands somewhere between the above positions, does not fulfil its mediating task because, ever since the Klieme expertise, it has abandoned all processual implications.[16]

The apparent resort to 18th- and 19th-century bourgeois ideals of education correlates with current concepts of learning theory that regard both scientific disciplines and educational sciences as essential components and whose relevance for teacher education seems irrefutable. With its subject-didactic background, the 'experiential theory of learning' developed by Arno Combe and Ulrich Gebhard (2007, 2009) defines 'learning' as a dynamic process that is triggered by 'crises' and involves the person as a whole. Encounters with the phenomena of our world, whose certainty and self-evidence become 'question-able' in the context of education at schools and universities, resemble a 'journey' to the inner self that, through the examination of these outside phenomena, gives rise to new knowledge and a new self-awareness. Such 'experiences of discrepancy' (Combe, Gebhard 2012, p. 31) stimulate learners into autonomous processes of finding meaning:

> One result, fragile as always, is usually a new way of looking at things and a new relationship with oneself and with the world. These processes manifest themselves as *knowledge*, *newly acquired routines* or *new meaning* and understanding. (Combe, Gebhard 2007, p. 109; cf. Heizmann 2018, p. 33–38)

In this manner, education is conceptualised as a space in which not only knowledge, but also ignorance, not only certainty but also irritation and not only understanding, but also non-understanding can and should become drivers of learning. This also means that experiencing contingencies, risks and crises is part of the educational process and that one objective of education could be to enable learners to deal constructively with contradictions, ambiguities and general non-understanding (cf. Dressler 2013, p. 185). Such processes let teachers feel their key role as *agents of education* by allowing them authentic educational experiences within the meaning of learning theory. Metaphorically speaking,

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16   It is worth noting that, contrary to its original intention, the term and function of 'standards of education' conflict with the current political movement of inclusion and individualisation in education. Special needs educators note that the 'one-sided overemphasis on educational standards, comparisons and tests [...] promotes the development of a school culture at odds with the values of inclusion' (Werning 2012, p. 50). This seems logical in so far as educational standards set common and uniform targets, while inclusive schools focus on individual learning profiles. Reichenbach (2011) also voices ethical objections to an empirical education research that is focused on outcome optimisation.

these are exemplary and authentic 'journeys towards educational responsibility', in the sense of lifelong learning, that are taken time and again. Their quality lies in the fact that they are never linear, but discontinuous, individual and unlimitable, and that they are neither geared towards 'results' nor can be quantified as *outcome*.

A concept that regards the permanent crisis of education as a chance of initiating educational experiences can transcend the seemingly narrow limits of teacher training to have an impact on the research community as a whole. In this concept, 'education' is not just a topic, but the paradigm of scientific self-understanding:

> Education cannot be translated into the normality of administration and the presentation of knowledge. It is the genuinely ethical process of freeing the individual – in Hegel's words – as an absolute point of passage in the subject's development towards free selfhood within the general forms of society. This means that there are no special education crises because education itself is the crisis from which society constantly recreates itself. And that is precisely why the topic of education and its organisation deserves the attention of the educated among its detractors. (Zenkert 2017, p. 12)

With its special responsibility and competence for the generation of educational processes, teacher education has a significance in today's highly complex scientific system that extends far beyond questions of vocational training. With this scientific system, civil society has created the optimal space and the optimal expertise to study contradictions and begin resolving them through the exchange of views, and this is where teacher education can assume a specific role. It becomes an integral component of the mutual legitimisation of scientific disciplines and of their obligation to help shape our open-minded, humane and democratic society. By having, and being able, to build on the networking and cooperation of teacher training institutions as a synergistic nucleus, and on interdisciplinary and transdisciplinary research in all involved subjects and disciplines, it strengthens these areas in turn – in its capacity as a structurally transdisciplinary system – as they cope with their tasks for the future. It is able to provide an adequate framework for interdisciplinary and transdisciplinary discussion in *all* institutions, domains and stakeholders involved in teacher training and to bring the various, often highly controversial scientific positions, research methods and objectives with all their differences, delimitations and target conflicts up for discussion – because doing so enhances its own scientific profile. The result is no more and no less than a demand for a transdisciplinary discourse structure that, while arduous and time-consuming, nevertheless

promises benefits for all issues and stakeholders. The diversity of, and many subjects involved in, teacher education at universities – which is frequently regarded as a deficit – offers an invaluable potential that should be tapped to a far greater extent if the stakeholders are to live up to their common responsibility for the academic *polis*.

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