

Chapter 2

Teacher Education in Germany: Educational Structures, Historical Developments and Academic Challenges

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This chapter begins with an overview of historical developments in Germany's teacher education. It explains the changing characteristics of the teaching profession with a focus on teacher education for the German Gymnasium, a school type leading directly to A-Levels. The requirements and structures of teacher education in Germany today are introduced, including current models and patterns, teachers' standards and teacher certification, induction and professional development structures.

The second part focuses on emerging challenges faced by educational governance, educational research, and educational practice today. These include teacher shortage and recruitment, inclusion and educational equality, changing school structures, professionalization of teachers, and digitalization in education. The chapter closes by summarizing the challenges and future directions of teacher education, showing how teacher education can react to and integrate local and global challenges at schools and universities.

1 Introduction

Schools are places in which education and Bildung¹, instruction and development, and the qualification of society's future generations take place. Schooling influences

¹ The German term 'Bildung' is rooted in German idealistic thinking. It defines education as self-development, self-actualization and critical reflection, as opposed to education that focuses on the adaptation of existing knowledge, pre-established competences, or societal expectations (Biesta, 2002; Koller, 2017).

not only individual life courses as well as personal and career opportunities, but also societal cohesion and the overcoming of future societal and global challenges. Thus, modern educational systems serve to “constitute basic cultures and mindsets, identity and the communicative abilities of its members – and to establish those in future generations in order to protect cultural coherence and the cohesion of the societal community” (Fend, 2008, p. 49). These functions of schooling are undisputed. By establishing public schools, the government moves schooling away from other subsystems such as family, and establishes public schooling as a publicly controlled subsystem that specializes in a certain type of long-term, systematic and cumulative learning (Baumert, 2006). This procedure emphasizes the aim as well as the opportunity to make societal participation independent of social backgrounds, to generalize participation and to make it accessible for all (Tenorth, 1994). However, as history shows, the German school system is susceptible to political controversies and ideological misuse.

Governments are aware of the importance and impact of school and education. In Germany, up to 150 billion euros (4.3% of the GDP) were used for the educational sector in 2019. In consequence, the government holds authority over aims, processes and contents, setting the standards for the use of educational contents and structures. Teachers carry the responsibility for reaching educational goals in collaboration with their students. Describing teachers as “deputies of societal modernization processes” (Sandfuchs, 2004, p. 15) indicates the strong societal importance of teachers. Empirical research confirms the importance of the individual teacher for successful learning processes: “It depends on the teacher” (Lipowsky, 2006). The governments' fundamental concern is that upcoming generations will be best prepared to face societal challenges if educated by highly qualified and well-trained teachers. This is why the government claims to define aims, structures, processes, and contents in academic teacher education. It is also reflected in the school-based phase of initial teacher training: teaching students have to pass examinations, which are regulated by the educational ministry, before finally entering the teaching profession. School curricula and educational frameworks are also defined by educational ministries. A recent example of policy-based reform is the Quality Initiative for Teacher Education, which began in 2014. Here, the provision of governmental funding for the teaching degree programs B.Ed and M.Ed. is closely monitored, and content-related decisions are defined by governmental institutions, or negotiated between government and higher education.

This chapter aims to introduce basic structures of teacher education in Germany. Applications and examples are included with reference to the approach of the Tü-

bingen School of Education. As the Tübingen School of Education provides teacher education for the Gymnasium, the German high school, this chapter has a focus on Gymnasium teacher education.

2 The German basic education system

Traditionally, the German educational system has been three-tiered, with students being separated into three different school types after primary school, according to their achievements (Figure 1; see Sandfuchs, 2004; Terhart, 2016). The development of schools today aims at a two-tiered system, but in many states, including Baden-Württemberg, there are more school types remaining.

Students in Germany visit primary school for four years before enrolling in secondary education. The secondary school types Gymnasium, Realschule and Hauptschule have shaped the German educational landscape for several centuries, though the names of the school types have varied through history.

Gymnasium is the German equivalent of high school leading to the Abitur, the German school-leaving certificate, which is comparable to Advanced Levels (A-Levels). Gymnasium education begins in year 5, leading directly to the Abitur in year 12. It is characterized by expecting the highest academic standard from its students.

Realschule is the German equivalent of middle school. Education at Realschule begins in year 5 leading up to year 10, with an examination comparable to O Levels. Realschule prepares students to enter vocational schools and the labor market at approximately 16 years of age. Hauptschule is another type of middle school, beginning in year 5 and leading up to year 9. Hauptschule used to be a school for students demonstrating lower academic results than requested at Realschule. Its graduates were also prepared to enter the labor market or vocational schools at the age of 15 or 16.

Since 2010, the federal state of Baden-Württemberg reformed its educational system, aiming for a more inclusive type of middle school. This new type is called the Gemeinschaftsschule (community school). It offers curricula for all three aforementioned levels and leads to different O Level options. Some schools of this type even offer a path towards the Abitur after year 13.

Special needs education in Germany allows learners to enroll at specialized schools or to receive inclusive education through support structures within a Gymnasium or Gemeinschaftsschule. Inclusive education was introduced during the last decade.

Figure 1 shows the German educational landscape in 2019.

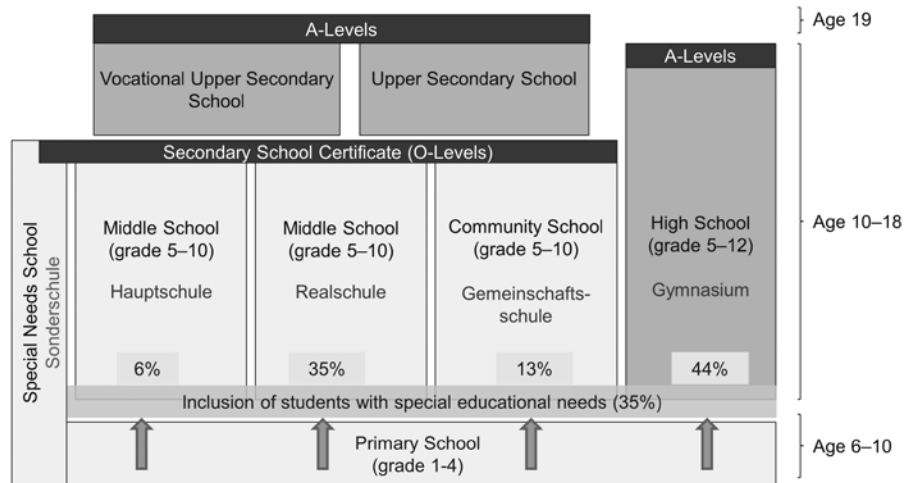


Figure 1 School system in the federal state of Baden-Württemberg in 2019

The historically three-tiered school system which allocated and still allocates students in Germany at the early age of ten to different educational institutions, contributes to and reproduces social divisions in Germany's society until today. The allocation to school types often correlated with parental social backgrounds, this influence still remains until today to a smaller degree. (Büchler, 2016). The early allocation to a certain school type was also criticized as having stigmatizing effects on learners and their families. While for decades, allocation to secondary school types was based on academic grades, it has been based on parental choice since 2010 serving as an important step towards educational equality.

Formally, the present school system in Germany is highly differentiated, with 16 federal states (Bundesländer) creating their own educational landscapes. One shared element is the school type Gymnasium, which remains in all federal states, while other secondary school types vary. Current controversies include the question of whether other secondary school types should establish a curriculum leading to the Abitur and offer examinations for it.

3 Historical developments in teacher education in Germany

The school system and the development of teacher education are closely connected. Looking at historical developments, the Gymnasium teacher served as a teacher for all school subjects since the end of the 18th century. The profession was created to strengthen the division between the clergy and education. The high school teacher was a

classical philologist, serving general human education and especially *Bildung*, according to German new-humanistic ideals.

Since 1834, the Abitur was required for enrollment at universities in the region then called Prussia. A future high school teacher had to study the high school subjects and complete a governmentally controlled exam on subject knowledge. High school curricula developed a broader range of subjects, in addition to the classical philologies, such as foreign languages and natural sciences. A high school teacher was required to be an academic with profound content knowledge. The Gymnasium became an established form of exclusive schooling for a small male part of the population. The two characteristic phases of teacher education gradually became more differentiated. High school teachers had to study two subjects during the academic studies phase. From 1917 to 2017, the second, school-based phase was completed with the second state examination. Teacher education for other school types, especially the general community teacher (primary and lower secondary teacher covering grades 1–9), used to follow the model of high school teacher education. However, several differences remained due to the length of studies, salary, reputation and self-image. The education of general community teachers developed gradually during the 19th century through the establishment of teacher seminars and of compulsory education for anyone living in rural areas.

A further important step was the requirement of the Abitur for future community teachers since 1927 in Prussia. All teaching applicants had to complete academic studies (with different durations), followed by initial teacher training.

In the second half of the 20th century, teacher education became more academic for teachers in lower secondary and primary school. High school teaching degree programs, on the other hand, included more pedagogical competences. Theoretical models of learning and achievement became more nuanced, and their development has led to a long-lasting impact on the educational system. Theoretical educational ideals assigned to different school types in Germany were questioned, leading to a new and critical academic discussion about all school types and age groups since the 1970s (see v. Ackeren, Klemm & Kühn, 2015). A new concept of the teaching profession evolved, and is best described by Terhart (2016, p. 27): a teacher is “an academically trained expert for teaching and learning: with profound knowledge on subject and methods, supporting his/her students as an educational coach, a competent counsellor for parents, cooperation with colleagues, open for professional development and innovation”. The Bologna Process at the beginning of the 21st century shaped the organizational aspects of teaching degree programs: the former 5-year teaching degree programs were replaced by a 3-year bachelor's and a 2-year master's degree. From then on, ex-

aminations were led by academic representatives instead of governmental representatives. The polyvalent degrees and the bachelor-master structure were introduced to advance mobility between universities in Europe and worldwide. The new cumulative study structure allowed graded study results from each year to be factored in, instead of grading only the final examinations after year 5.

4 Current state of teacher education

The current situation of teacher education cannot be easily described. Due to the autonomy of the sixteen federal states in educational matters, the structure of teacher education is defined individually by each state. The German high school, *Gymnasium*, has remained as an institution in all 16 federal states, while the number of other school types varies greatly. Between two and five different school types exist additionally, depending on the federal educational policy. In order to compare the different structures across the federal states of Germany, the Conference of the Ministers of Education (KMK) defines six types of teachers.

Teaching degree type	Description
Type 1	Primary teachers
Type 2	Teachers for primary school and all or some lower secondary schools
Type 3	Lower secondary teachers for all or some lower secondary schools
Type 4	Teachers for high schools
Type 5	Teachers for vocational schools
Type 6	Special needs teachers

Table 1 Teachers according to school types (Kultusministerkonferenz, 2019)

On the institutional level, teacher education takes place at universities throughout Germany. Baden-Württemberg is a special case: Universities of Education co-exist with General Universities. The former offer teaching degree types 1, 2, 3 and 6, while the latter offer teaching degree types 4 and 5.

At the University of Tübingen, there are 27,500 students (winter term 2019/2020), of which 3,800 study teaching. This constitutes 18% of the students, underlining that teacher education is a large and important field in Tübingen. It offers more than 25 teachable subjects, ranging from established subjects such as Math and English, to Chinese and Astronomy. Less common subjects are highly valued as they contribute to the development of individual school profiles and allow students more

options for choosing subjects according to their individual interests and goals. The following graph shows the academic subjects with the highest percentage of teaching students:

Subject	Number of teaching degree students	Percentage of teaching degree students
Mathematics	431	59,45 %
German	940	51,65 %
English	1516	61,58 %
Physical Education	407	58,34 %
Islamic Theology	103	44,02 %

Table 2 Percentage of teacher education students in selected subjects (at the University of Tübingen in 2019/20)

Table 2 illustrates that Tübingen's large and traditional subjects, as well as some of its younger subjects, are chosen to a large degree by teaching degree students. In Baden-Württemberg, the University of Tübingen hosts the highest number of students studying teaching degree type 4.

Study programs in all federal states and for all teachers consist of four clearly defined areas: content knowledge (CK), pedagogical content knowledge (PCK), educational sciences / pedagogical knowledge (PK), and school internships.

The multiple school types, however, created several differentiations: the key characteristic in the education of Gymnasium teachers is a higher proportion of subject-specific content knowledge (CK) and a smaller proportion of pedagogical content knowledge (PCK) and pedagogical knowledge (PK).

New topics have been added during the last 10 years. They include: diversity and inclusion, digital media education, subject-specific content knowledge in all teachable subjects, global educational perspectives, as well as research-based mentoring during school internships and beyond.

During the last 20 years, the discussion and creation of research-based national standards in teacher education has begun. One significant result of this is that the KMK's 2004 'Standards for Teacher Education: Educational Sciences' were implemented in all federal states (Länder). They are points of reference for the education of future teachers in the academic phase as well as in the school-based phase. They are also a guideline for creating new structures in teacher education. By applying these standards, different teaching degree programs in the 16 federal states are made more comparable in terms of their minimum requirements and levels (Terhart, 2007). The standards fueled discourses in teacher education research regarding standards, minimum

requirements, measurability and accountability, the relation of theory and empirical research, and professionalization theory. They were also criticized for leading to simplistic perspectives on teachers' abilities and for being tools of strong regulation and control. Still, the standards are formulated as very broad competences, leaving maximum openness in how to reach them. As Terhart argues, the existing aims and expectations of this public profession were merely put into official words (Terhart, 2007, p. 9). Standards for pedagogical content knowledge were also created by the KMK in 2019. The discussion of the PCK standards is highly dependent on their specific realization at the different universities and thus mainly continues within universities. However, the approaches for standardization cannot change the fact that 16 different educational structures are implemented in Germany's federal states due to their autonomy in cultural and educational matters. This leads to more questions regarding teacher education: should it take place according to age and educational stages, or according to school types? Which classes are the same for all students? Do the changes in school types correspond to differences in teachers' payment? These questions are again addressed differently in each federal state.

4.1 Bachelor's and master's structures for teaching degree programs

In most German federal states, former so-called state examination degrees for teachers have transformed into consecutive bachelor's and master's degrees during the last decade. Many federal states, such as Baden-Württemberg, switched to a bachelor's and master's structure, while some, like Saxony and Hesse, maintained the former state examination structure. But even within the new structure, variations remain within Germany, especially in the bachelor's programs: a Bachelor of Education serves as basis for the Master of Education and focuses on the teaching profession from the beginning; a polyvalent Bachelor (of Arts or Sciences) can serve as foundation for different master's programs and allows more flexible career choices. On the master's level, the Master of Education, which has a clear focus on the teaching profession, is the prerequisite for teaching at public schools. The study programs differ in length as well as in the number and allocation of ECTS points (points within the European Credit Transfer System). The duration of studies differs, especially for teaching degrees of type 1 (primary teaching), which varies in length and salary in some federal states. The existing differences between the federal states challenge the overall comparability, as well as the transfer between universities, even though the KMK works on the basis of the mutual acceptance of degrees. The situation is criticized in multiple ways and typically described as patchwork (Keuffer, 2010, p. 51).

4.2 Academic structures of teacher education at the University of Tübingen

Studying teaching in Tübingen means studying to become a high school teacher (teaching degree type 4). A small number of students studies to become a vocational teacher (teaching degree type 5). The structure of the study program is defined by Baden-Württemberg's educational framework, which sets standards for duration, distribution of credits, and curricula. Tübingen chose to offer a Bachelor of Education instead of a polyvalent Bachelor (of Arts or Sciences), requiring students to focus on the teaching profession from the very beginning. Figure 2 illustrates the study program for high school teachers (teaching degree type 4) which is offered at the University of Tübingen.

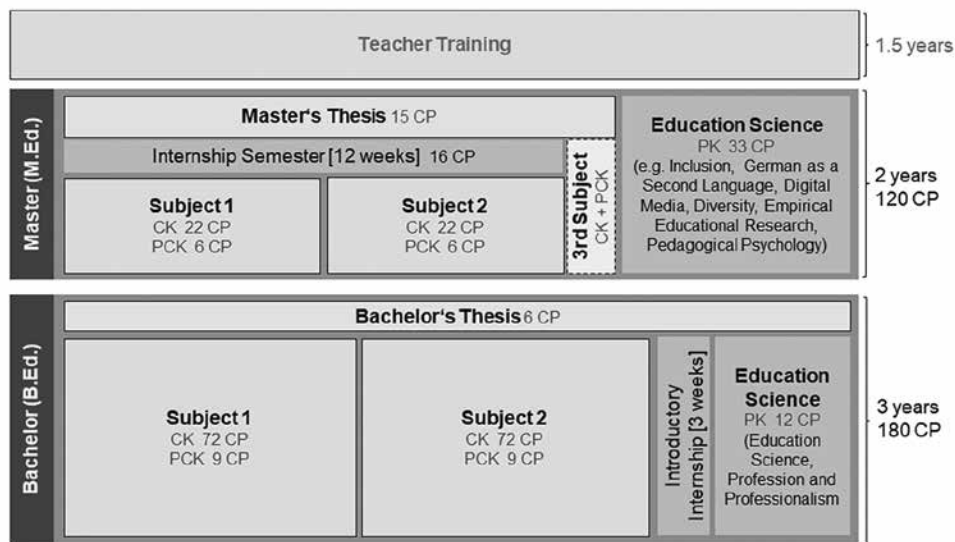


Figure 2 Structure of the consecutive teaching degree program at the University of Tübingen

Like all national teaching degree programs, the program consists of four fields: content knowledge (CK), pedagogical content knowledge (PCK), educational sciences (PK), and school internships. With the introduction of the bachelor's and master's system, the PCK and PK parts were strengthened, while the CK parts were reduced. The main internship (12 weeks) is offered during the Master of Education, which is rather late. Students study two subjects in addition to educational sciences, and a third subject may be chosen voluntarily to improve career opportunities later on.

5 Teacher certification, induction and professional development

5.1 Teacher certification

To become licensed teachers, students must complete two certificates. The academic studies are completed with a Master of Education. Here, the students develop research-based knowledge in two school subjects as well as in educational science. During their school internships, they gain insight and develop their ability to reflect. The school-based phase is completed with the second state examination for teaching. Graduates from the M.Ed. enroll in 1.5 years of supervised teacher training and must pass teaching practice examinations, where the student teacher's teaching is examined in class, as well as oral examinations.

5.2 Induction

The induction phase consists of 1.5 years of supervised, school-based teacher training, as well as the subsequent first years as an official teacher. „During teacher training, the trainees enlarge and deepen their PK and PCK knowledge, which they acquired during their first phase of education, enabling them to fulfil the educational and developmental aims at high schools successfully and responsibly” (Cramer, Johannmeyer & Drahmman, 2019a). During the first years in the job, further examinations must be passed in order to receive full status as a lifelong civil servant.

5.3 Professional development

The teaching profession in Germany is shaped by a two-phase education (academic and school-based), followed by „decade-long continuous professional practice“ (Drahmman & Huber, 2019). Teachers are expected to react professionally in various educational situations and to respond to societal changes, which requires a reflective attitude combined with continuous development of knowledge and competences. Professional development should therefore be an important part of teacher professionalism. However, professional development regulations for teachers in Baden-Württemberg are vague, and participation is rarely assessed by principals or educational authorities. The professional development of teachers is a field that is only partly structured and hardly empirically analyzed, according to Cramer et al. (2019a). Professional development courses should be clearly integrated in teachers' schedules and the quality of these courses should be assessed regularly (Cramer et al., 2019a). The Tübingen School of

Education supports several empirical research projects on teacher professional development and offers research-based classes covering new topics in teacher education.

6 Emerging discourses in teacher education

The development and structure of teacher education is a strongly discussed topic within the academic community as well as in educational policy discourse. The omnipresent slogan “teacher education must be improved” reveals the demand for teachers to initiate changes in society and education. Current topics and discourses cover societal challenges such as digitalization and globalization, practical educational problems such as teacher shortage and changes in school types, academic discourses such as professionalization theories, and developments in the underlying values of educational settings, such as implementing inclusion and achieving educational equality. The following section introduces essential current discourses of educational governance, educational research, and educational practice.

6.1 Teacher shortage and teaching licenses for other professionals

Increased migration and growing birth rates have led to higher enrolment rates at schools in Germany. Additionally, new school concepts such as longer school days and inclusive education have increased the need for teachers. The KMK expects an additional rate of 60.000 teachers during the next five years, while experts suggest even higher numbers (Klemm, 2019). To cover the teacher shortage, all federal states have established routes for other professionals to enter the teaching profession and receive different types of teaching licenses. The approach has been criticized for deprofessionalizing teaching in times of shortage; however, there are few alternatives. The urgent teacher shortage in all school types except high school is rooted in the historically differing study programs, salary, reputation, and self-image of the teaching profession. In socio-economically challenging regions, as well as in rural regions, the teacher shortage becomes even more urgent.

6.2 Inclusion as a challenge in schools and teacher education

Educational systems and teacher education work towards inclusive education, turning institutional, national and international guidelines of inclusion into reality. Inclusive schooling includes accepting and respecting diversity, while reducing discrim-

minatory attitudes, contents, and educational structures (Prengel, 1993). The Index for Inclusion serves as a pragmatic reference for inclusion (Booth & Ainscow, 2017), while the term “inclusion” itself can be understood in multiple ways.

In the following, three approaches of inclusion are introduced, from narrower concepts to wider ones (Lindmeier & Lütje-Klose, 2015):

- ▶ Inclusion in a narrow sense, as reducing barriers for persons with handicaps.
- ▶ Inclusion in a wider sense, as „education for all“, focusing on differences between learners.
- ▶ Focusing on all learners, but especially focusing on vulnerable groups. “Education for all, and especially for some.”

Turning a traditionally divided school system into an inclusive one creates several challenges. Pathways to the Abitur are becoming more flexible and variable. Gemeinschaftsschulen (community schools) create a direct path towards the Abitur (Gemeinschaftsschule with an upper secondary option). Vocational training develops a higher reputation and can be combined with other educational pathways. This makes it possible to accept advanced craftsman titles as equivalent to Abitur, allowing some applicants to enroll into study programs within the thematic field of their respective craftsman training.

Learners with diagnosed special educational needs in Germany choose between inclusive education and special needs schools. This allows learners who choose inclusive education to enter a direct path towards the Abitur while receiving specialized support. At German schools and in German society, the perception of inclusion is gradually shifting from narrow concepts to wider ones. The different solutions in the educational system again reflect the situation in teacher education: on the one hand, a specific teaching degree for special needs is offered (type 6); on the other hand, topics of inclusion have become a stable element in all teaching degree programs.

The Tübingen School of Education has committed to including topics on diversity in their teaching degree programs: since the beginnings of the Quality Initiative Teacher Education in 2015, a new chair has been established for the field diversity, inclusion and exclusion at the University of Tübingen. The chair offers a compulsory module – „Fundamentals of Inclusion, Diversity and Heterogeneity” – within the Master of Education, ensuring that all teaching degree graduates have worked on fundamental aspects of inclusion during their studies. Each module serves as thematic unit, consisting of one or several classes. A completed module indicates that the student has achieved the learning goals of the respective unit. Topics range from language-sensi-

tive teaching, migrancy, and class, to gender, religion, and theories of inclusion and exclusion. Additional qualification modules are offered for students who wish to deepen their knowledge in areas such as multilingualism or anti-racist educational work.

Including a new topic in teacher education led to changes on the curricular level: carefully edited ECTS packages were adapted, replacing established topics with more recent ones. This resulted in the reduction of some elective modules or in less flexible study plans – changes which challenged students and lecturers alike.

6.3 Teacher professionalization theories

In Germany, the academic discourse on teacher professionalization is dominated by the following three approaches (Hermann & König, 2016).

- ▶ Professional competence theory: the term „competence“ shapes the discourse on international comparative educational research, the most common study being PISA (Program for International Student Assessment). Competences are defined as skills for solving problems at work and at home. Competences can be taught, learned and assessed via specific test tasks.
- ▶ Helsper's approach, structural theory (2011), emphasizes that teacher professionalism consists of specific structural, logical elements. These elements must be reconstructed in order to be analyzed reflectively. The approach focuses on basic structures between learners and teachers, and less on subject-specific questions. Helsper describes several antinomies, such as distance versus closeness and trust versus control, which shape the characteristics of teaching situations.
- ▶ Professional biographical theory focuses on the individual personal and professional development of a teacher. Becoming a professional teacher is described as an individual professionalization process aiming at developing one's own professional identity.

The three approaches compete with and complement each other at the same time. Cramer et al. suggest developing a metatheoretical perspective, allowing reflection on and integration of several approaches (Cramer et al., 2019b). Universities and researchers in German-speaking countries differ widely in their teaching and application of the above-mentioned approaches, revealing different perspectives on the essence of the teaching profession.

6.4 Digitalization

Increasingly, schools and education are urged to react to the dynamic societal developments in the field of digitalization. The challenges arising from the COVID-19 pandemic are another reminder of the necessity for schools and teachers to include digital learning with innovation and efficiency. Looking at international developments, Germany has fallen behind in digitalization (Eikermann et al., 2019). Current challenges range from schools' and universities' technical equipment, educational theories and methodologies, to critical ethical perspectives on digitalization processes.

To integrate digitalization topics in teacher education at the University of Tübingen, a new Center for Digitalization has been created. The center is led by the Chair of Teaching and Learning with Digital Media, which has also been funded by the Quality Initiative Teacher Education. The Center allows research to be conducted within the broad spectrum of teaching and learning with digital media in a structured and sustainable way. The overarching challenge is to prove the benefit and efficiency of using digital media, as opposed to more traditional methods. Research in teacher education revolves around the 'TPack-Model' (Technological Pedagogical Content Knowledge), which connects technological knowledge with pedagogical knowledge, content knowledge and pedagogical content knowledge, building an adequate framework for the use of digital media at schools (Mishra & Koehler, 2006).

7 Summary and concluding remarks

Education and high-quality teaching are central topics in Germany's society. Reforming or modernizing teacher education depends on multiple structural and practical factors: it requires creating an awareness of urgent societal and educational needs, as well as structured academic expertise to provide high-quality results and implementation in a sustainable way.

The Tübingen School of Education has developed the following model to illustrate how societal needs, teacher education, schools, and the individual citizen build on each other (Figure 3).

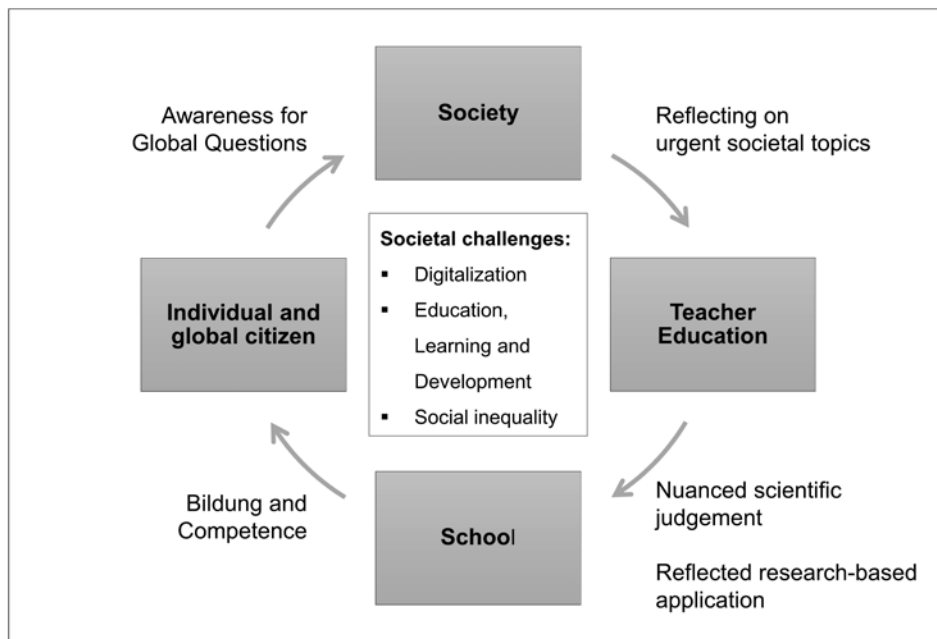


Figure 3 Societal needs and teacher education

Societal and educational changes and challenges are constantly imposed on teacher education. Recent examples of emerging topics in teacher education are the above-mentioned areas of digitalization and inclusion. During the last 10 years, both fields have been systematically incorporated into teacher education at German universities, supported by strategic university decisions and additional funding. Successful future-oriented teacher education enables teachers to contribute to evolving structures and professionally work with upcoming challenges at schools.

This chapter has given an overview on the challenging and ongoing change processes of teacher education at the University of Tübingen, as implemented by the Tübingen School of Education and its multiple partners. Developing and conducting high-quality, research-based and up-to-date teacher education is an ongoing process of negotiation between academia, society, stakeholders in schools and school administration, and the government. During the last years, the University of Tübingen has put enormous means and effort into this change process. The success of this process builds the foundation for the ability of our younger generations to master future challenges – on the local and the global level.

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